Journal of World Prehistory, Vol. 17, No. 4, December 2003 (© 2003)

The Early Development of Pastoralism in the Central Zagros Mountains

Kamyar Abdi[1]

This paper explores the changes in early forms of pastoralism in the West Central Zagros Mountains from village-based herding in the Neolithic period to initial stages in the formation of full-fledged nomadic pastoralism by the Late Chalcolithic period. It has been argued that the initial development of pastoralism in the Central Zagros Mountains should be viewed as an adaptive strategy to a highland environment with limited and dispersed resources in order to supplement a primarily agricultural village-based economy. With expansion of the agricultural regime, the distance to be traveled to pastures by herders became greater, and as a consequence, the organization of labor involved in herding had to be modified to meet the more complex task of moving sizable herds over larger areas. The empirical evidence for the assessment of hypotheses proposed in this paper comes from archaeological fieldwork in the Islamabad Plain in the Zagros Mountains in western Iran, as well as previous archaeological and ethnographic research in the region.

KEY WORDS: human ecology; pastoralism; nomadism; Zagros Mountains.

INTRODUCTION

Pastoralism, in its various forms, has played an important and diverse social and economic role in the Near East since the domestication of the primary herd animals—sheep and goat—in the Neolithic period. In some times or places the dominant economic pursuit and in other times and places a less significant aspect of production system, pastoralism has nonetheless always been an integral part of Near Eastern society and economy (Adams, 1974;

[1] Department of Anthropology, 6047 Silsby Hall, Dartmouth College, Hanover, New Hampshire 03755; e-mail: kamyar.abdi@dartmouth.edu.

0892-7537/03/1200-0395/0 © 2003 Plenum Publishing Corporation

Barfield, 1993; Bar-Yosef and Khazanov, 1992; Bernbeck, 1993; Clutton-Brock, 1989; Clutton-Brock and Grigson, 1984; Cribb, 1991a; Digard, 1981; R. Dyson-Hudson, 1972; Flannery, 1969; Marx, 1977; Salzman and Sadala, 1980; Spooner, 1973; Tapper, 1979, 1998; Vardiman, 1977). Especially in the mountainous regions of the Near East, such as the Zagros Mountains, pastoralism was the dominant economic pursuit until the introduction of modern agricultural techniques less than a century ago (Amanollahi-Baharvand, 1975, 1989, 1992; Barth, 1961; Beck, 1990, 2003; Black-Michaud, 1974, 1986; Bradburd, 1996; Lambton, 1953; Marsden, 1978; Oberling, 1974; Stauffer, 1965), providing pastoralists with an adaptive strategy to make more efficient use of the limited and dispersed resources of the Zagros highlands.

So far, research on the early history of pastoralism in the Near East has concentrated on two pivotal turning points: (1) the domestication of basic herd animals in the Epipaleolithic to Early Neolithic periods (ca. 11,000–9000 B.P.); and (2) the emergence of full-fledged nomadic pastoralism, presumably sometime between the Middle Chalcolithic period and the Early Bronze Age (ca. 6500–5500 B.P.).

Archaeological research since the 1950s has furnished us with information on the origins of food-producing economies in the Near East, including the domestication of herd animals and incipient forms of pastoralism (cf. Blumler and Byrne, 1991; Braidwood, 1952; Cowan and Watson, 1992; Flannery, 1969; Hesse, 1982, 1984; Hole, 1989, 1996; Reed, 1961; Zeder, 1999, 2001; Zeder and Hesse, 2000). It is now more or less clear that the emergence of a food-producing economy consisted of two forms of economic activities: agriculture and animal husbandry.

Recent research shows that early domestication of plants took place sometime around 12,000 B.P. in the southern Levant (Bar-Yosef and Belfer-Cohen, 1989; McCorriston and Hole, 1991) and from there gradually expanded to the rest of the Near East through the so-called "Levantine corridor." Within a few centuries, agricultural communities were established in the Zagros–Taurus Mountains where, in addition to early agriculture, gathering of wild plant resources and hunting of wild animals continued for several millennia. Once sedentary villages were established, the faunal evidence from most sites indicates a rather sudden increase in caprines (sheep and goat) by 9500 B.P. (Helmer, 1989; Zeder, 1994) indicating domestication of sheep and goat and the emergence of herding (Legge, 1996). It seems that herding and farming developed out of greater exploitation of plant resources that increased in geographic range and density with the end of the Ice Age, as well as ungulates that were also dependent on these resources. Our understanding of the timing and tempo of this process is still imperfect, so it is not entirely clear whether herding developed after farming was established (as seems to be the case in the Levant) or whether herding developed about

the same time as farming, as in northern Levant, southeastern Anatolia, and probably the Zagros (Hole, 1996) or perhaps even independently of agriculture in some parts of the Near East.

The other transformation in the early history of pastoralism in the Near East is the emergence of nomadic pastoralism sometime between 6500 and 5500 B.P., presumably in several locations including the Zagros Mountains. Not surprisingly, the economic and military significance attached to nomadic pastoralism has led to a great amount of research on the origins of nomadism and its contribution to the course of Near Eastern history (Castillo, 1981; Cribb, 1991a; Gilbert, 1975, 1983; Henrickson, 1985a; Irons and Dyson-Hudson, 1972; Khazanov, 1994; Nelson, 1973; Scholz, 1995; Zagarell, 1989). The origins of nomadic pastoralism is arguably one of major developments in Near Eastern prehistory. As a completely new socioeconomic formation, nomadic pastoralism came to play a significant role in shaping the course of ancient Near Eastern civilization (cf. Adams, 1974; Rowton 1973a,b, 1974), as well as modern Near Eastern societies (cf. Khoury and Kostiner, 1990). While there is a consensus among archaeologists that the Zagros Mountains was one of several regions where nomadic pastoralism first emerged, estimates on the date when this took place range from the Neolithic (Hole, 1977; Mortensen, 1972; Zagarell, 1975) to the Late Chalcolithic (Henrickson, 1985a).

There is no argument that domestication of herd animals and the emergence of nomadic pastoralism are two pivotal transformations in the early history of pastoralism in the Near East. However, archaeological research by the author in the Central Zagros suggests that several intermediate phases in the development of pastoralism from village-based herding to nomadic pastoralism may have been overlooked. So far, most theories on the origins of nomadic pastoralism (e.g., Gilbert, 1983; Henrickson, 1985a; Hole, 1978; Lees and Bates, 1974) view the development of nomadic pastoralism out of incipient village-based herding as a single-stage shift from an agricultural economy to a pastoralist economy, or attempt to reduce successive intermediate steps into a direct transition from sedentism to nomadism that seldom receive more than a brief analysis.

However, intermediate steps in the development of pastoralism from village-based herding to nomadic pastoralism need to be defined and archaeologically described because the shift from incipient, short-range, village-based herding to highly mobile, full-fledged nomadic pastoralism should be viewed as a major social transformation that was realized only through a number of major steps over several centuries. What needs to be addressed is how and why increasing dependence on the pastoralist means of production, and consequently increasing mobility to gain access to pastures, led to a shift in logistics of living from sedentism to nomadism, and how this provided a

basis for the formation of a pastoral mode of subsistence based on a new social organization revolving around a newly established nomadic identity.

What we are concerned with in this paper is the intermediate trajectory of pastoralism from the establishment of early village-based herding to the formation of a full-fledged nomadic pastoralism in the western part of the Central Zagros Mountains. It will be argued that this drastic social change was accomplished through several steps characterized by distinct forms of pastoralism distinguished by the size of the herd, distance traveled, and organization of labor involved in herding activities.

TERMINOLOGY

In its broadest sense, pastoralism may be defined as dependence upon domestic herd animals held and bred as capital (Chang and Koster, 1986). Unlike hunter and gatherer systems, in pastoralist systems, herd animals are accumulated wealth and represent the live resources of individuals and groups (Ingold, 1980). In this paper, more specific terms are used as follows:

Pastoralism is a mode of production concerned with the exploitation of domestic animals, in the case of the Near East caprines (sheep and goat). Pastoralism occurs in a continuum from fully sedentary (village-based herding) to fully mobile (nomadic) pastoralism (Fig. 1).

Mobile pastoralism is a form of pastoralism that involves movement of the herd beyond the agricultural zone, usually one to a few day's walk from the village.

Transhumant pastoralism is a specialized form of mobile pastoralism that is still based on settlements but involves seasonal movement of the herd between pastures with some use of campsites.

Nomadic pastoralism is the extreme form of mobile pastoralism. It is a mode of subsistence (i.e., a way of living) primarily relying on pastoralism involving high mobility and changing dwellings throughout the year, living in a succession of campsites along vertical or horizontal routes.

Pastoralism can be described as both a means of production and a mode of subsistence. "Means of production" is the act of production based on animals; "mode of subsistence" is a configuration of productive strategies and social relations allowing the exploitation of natural resources and reproduction of the social groups involved (Cribb, 1984). Therefore, a society may practice both pastoral means of production and agricultural means of production (see "village-based herding" below), or a pastoral mode of subsistence may coexist with an agricultural mode of subsistence, such as the coexistence of nomadic pastoralists and sedentary agriculturalists in an area,

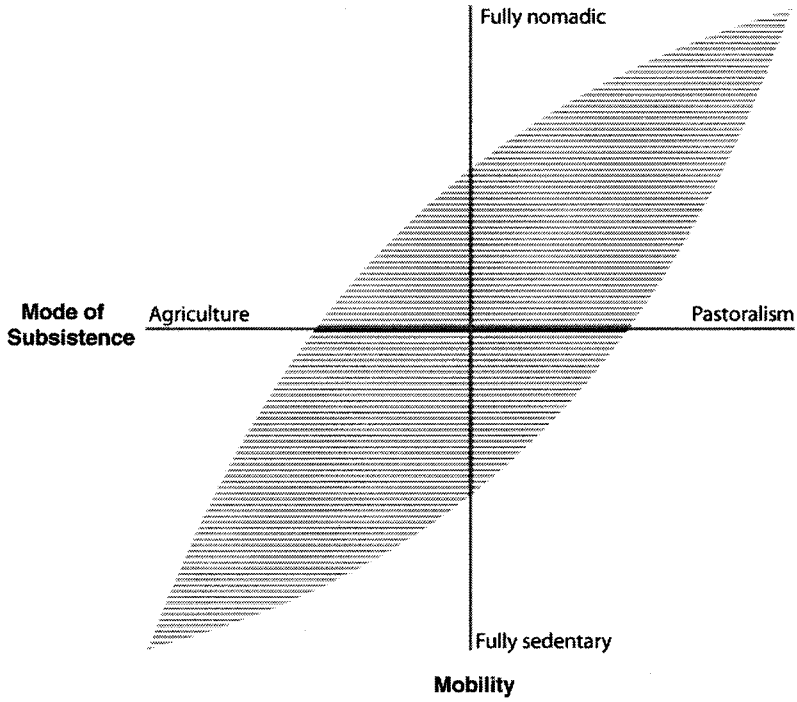


Fig. 1. The relationship between mobility and the mode of subsistence (after Cribb, 1991a, Fig. 2.1, with some modifications).

each using land and animals according to different systems, but both integrated into a wider regional economy (Barth, 1956, 1964; Swidler, 1973).

We can therefore place social groups along an agricultural–pastoral continuum based on various factors such as the degree of dependence on pastoral production or to the extent their income is provided through pastoralism as opposed to other modes of subsistence (Cribb, 1991a, p. 18). For example, village agriculturalists may keep a small herd without necessarily adopting all the elements of a pastoral mode of subsistence (cf. Dahl and Hjort, 1976). But, with burgeoning emphasis on pastoral production, along with growing size and number of the herd, comes increasing mobility (Salzman, 1971), with its own ecological imperative, as well as specialized forms of herd management (Huntington, 1972; Redding, 1981; Swidler, 1972), and changes in social organization (Marx, 1977; Tapper, 1979). The full manifestation of such a propensity toward pastoralism will ultimately involve a shift in logistics and social networks leading to the mode of subsistence characterized as "nomadic" (Cribb, 1991a; Spooner, 1971).

TRAJECTORIES TOWARD PASTORALISM

Currently, we know very little about the early phases of pastoralism in the Near East between the establishment of village life in the tenth millennium B.P. and around 4500 B.P., when written texts begin to provide some information on the practice (cf. Edzard, 1981; Szarzynska, 2002). In the absence of such testimonies before 5000 B.P., we have to base our hypotheses on studies of various forms of pastoralism by historians, ethnographers, and geographers, to be tested against the relevant archaeological evidence.

There is no generally accepted typology for traditional pastoralism. Some anthropologists even express doubts that there is an advantage in having any typology (cf. N. Dyson-Hudson, 1972; R. Dyson-Hudson, 1972). Such doubts are somewhat supported by the great individual and group variation in pastoral activities due to specific environmental and social variables. But a classification of basic forms of pastoralism is imperative in highlighting the main features in the social organization and economy of a given society. It has to be stressed, however, that these are "ideal-types" (*sensu* Weber) to assist us in isolating the key dimensions of pastoralism and detecting their archaeological signatures.

For the purpose of this study, the factors we use to define variations in pastoralism include the degree of mobility, division of labor, and social organization.

Village-Based Herding

This is perhaps the most basic strategy for pastoralism, still practiced in many rural parts of the world (Dahl and Hjort, 1976). In fact, village-based herding is of particular interest to students of the ancient and modern Near East, as it has usually been taken as the archetype of settlement and land-use characterizing the Near East from the emergence of early farming communities in the early Neolithic period to the present.

On the basis of the distance covered by the herd and herders, I have divided village-based herding into "proximate" and "distant" forms. In proximate village-based herding (Fig. 2), during the warmer months of the year, the herds graze in pastures and fallow fields adjacent to the permanent settlement and usually return to their pens every evening. During the colder months of the year, the herds are kept in pens and fed with fodder collected and stored during the harvest season or procured otherwise. This form of pastoralism is not the basic foundation of the subsistence economy, but is supplemental to agricultural production. As a result, the size of the herd is small and management is usually entrusted to younger members of the

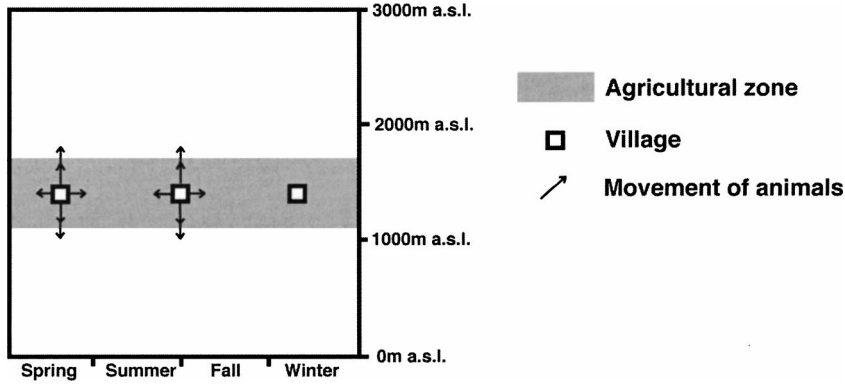


Fig. 2. Schematic diagram of proximate village-based herding in the Zagros.

household whose presence is not absolutely required for more important agricultural activities.

The organization of proximate village-based herding in time and space is closely connected to agricultural needs and dependent on seasonal availability of fodder for the herd. For example, it is necessary that the herd be kept away from cultivated areas when the crops are growing to avoid damage. However, there are insufficient grazing grounds near villages. Further, productivity as well as accessibility of different pastures vary during the year, which leads to the necessity for periodic movement of the herd through pastures at various elevations to allow the animals access to diverse fodder resources. Longer travel to access pastures leads to another strategy, i.e., distant village-based herding.

Distant village-based herding (Fig. 3) describes a strategy for pastoralism in which the distance traveled by the herd to pastures is greater than 1 day's travel, so the herd remains in pasture for an extended period of time, usually not exceeding more than a few days, before returning to the village or camp to be milked, for example. In distant village-based herding, the majority of the population continues to lead a sedentary life in the village, occupied for the most part with agriculture. Longer travel is required when a greater portion of the agricultural zone is brought under cultivation, thereby increasing the distance that must be traveled to reach pastureland. In forms of distant village-based herding that involve not too much travel, the herd may still be trusted to one or two members of the household, usually young adults, who are capable of caring for themselves and the herd.

One can argue that a new strategy of herding, transhumant pastoralism, has emerged when the herd, or more often part of it, is maintained for a longer period of time—anywhere from a few days to most of the year—on

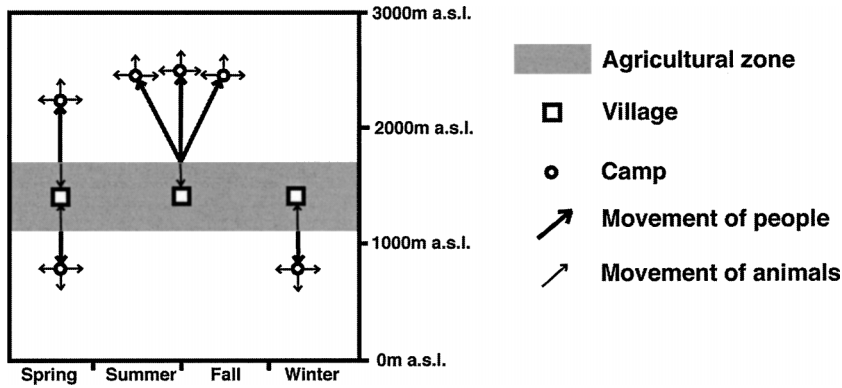


Fig. 3. Schematic diagram of distant village-based herding in the Zagros.

pastures, sometimes quite far from the settlement, tended by herdsmen specifically assigned to this task.

Transhumant Pastoralism

Transhumant pastoralism is a specialized form of herding that allows people occupied with agriculture in specific ecological zones, especially in mountainous regions (Grötzbach, 1982; Grötzbach and Stadl, 1997; Price, 1981), to use other areas as seasonal pastures when they are at their most productive time (Rinschede, 1988). In this strategy, the herd is kept on mountain pastures during warmer parts of the year and driven back to lower zones during colder seasons.

Described about a century ago as a regional pastoral practice in southern France, "transhumance" has come to have many connotations and global applications in recent decades. Sometimes it is used interchangeably with, and erroneously for, "nomadic pastoralism," and sometimes it is used to describe pastoral practices linked to certain ethnic groups (Husain, 1998; Jettmar, 1960; Martin and Sanz, 1998; Ponz, 1988; Rinschede, 1979, 1984, 1988; Vidal de la Blache, 1922).

Transhumance involves seasonal migration of the herds between summer pastures in the highlands and winter pastures in the lowlands. Because of the difficulties and perils of moving a herd over a long distance along varied terrain, the shepherds are not adolescents or younger adults from the households owning the herd in nomadic pastoralism (*contra* village-based herding above). Neither are they necessarily closely related to each other to form a group of relatives managing their common property (*contra* nomadic pastoralists below). In contemporary examples of transhumant pastoralism,

shepherds can even be wage laborers hired by the herd owners (Beck, 1980; Rinschede, 1979). The use of hired shepherds as wage laborers is a possibility with monetization and wage systems. In a nonmarket situation, such as the one we are concerned with in this study, the same effect can be achieved through kin and pseudo-kin links. In other words, members of an extended household may be selected for carrying out transhumant activities. As a rule, hired shepherds are neither related to herd owners, nor do they have livestock of their own. Herd owners, on the other hand, can be farmers or nonagrarian entrepreneurs (Rinschede, 1988). In terms of management, the year-round migration between suitable grazing grounds is independent of other economic activities of the herd owners. If they are farmers, their farm management and agricultural activities are not related to their livestock. However, herd owners sometimes provide shelter and grazing on their fields after harvest or on meadows. Common-property pastures are usually utilized in the mountains (Price, 1981), while customary rights or contracts with residents in the lowlands establish the winter grazing conditions (Jettmar, 1960).

Seminomadic Pastoralism

Seminomadic pastoralism marks the shift from an agriculturally oriented economy to one based primarily on pastoralism. Seminomadic pastoralism is characterized by extensive herding and a periodic change of pastures during the course of the entire or greater part of the year (Johnson, 1969). In this strategy, although pastoralism is the predominant activity, there is also agriculture in a secondary and supplementary capacity (Vincze, 1980). The following seem to be the most important and common variants of seminomadic pastoralism: (1) the entire group is occupied with both agriculture and pastoralism; and (2) within a society, there are groups who devote their time primarily, or sometimes exclusively to pastoralism, alongside groups who are primarily occupied with agriculture. In the latter variant, the men usually move with the herd and the women remain in one place, occupied with agriculture (Beck, 1998).

From an economic point of view, seminomadic pastoralism and full-fledged nomadic pastoralism are closely connected and often interdependent, forming many transitional states that depend on local, historical, and environmental conditions (Barth, 1956). In some situations, seminomadic pastoralism can be a relatively stable economic system and therefore function for a long time in a more or less immutable form (Amanollahi-Bavarvand, 1992). But, in other situations, seminomadic pastoralism can be a transitional stage between nomadic pastoralism and a mixed economy or vice versa.

Full-Fledged Nomadic Pastoralism

This strategy for pastoralism is characterized by high mobility and an almost complete absence of agriculture, even in a supplementary capacity. There are only a few ethnographically attested examples of nomadic pastoralism proper, especially in regions with little or no agricultural potential, including northern Eurasia (Vainshtein, 1980), High Inner Asia (Ekvall, 1968), and the African Sahara (Smith, 1992). However, even in those areas, nomadic pastoralism occurs with other forms of subsistence, including agriculture in more productive areas, and seminomadic pastoralism (Dyson-Hudson and Dyson-Hudson, 1980; Krader, 1959).

In fact, what is usually being described as nomadic pastoralism in the literature is a seminomadic strategy with greater emphasis on pastoralism than on agriculture. The nomadic pastoralist economy and labor activities are predominantly based on animal husbandry. In the Near East today, mixed herds are composed of sheep and goats for pastoral production (Cribb, 1987; Huntington, 1972; Redding, 1981, 1984), and cattle, horses, donkeys, and camel for transport. What is important in nomadic pastoralism is the fact that the whole group, tied by strong kinship relations (Digard, 1987; Marx, 1977), covers considerable distances between lowlands and highlands during their seasonal migration between suitable and accessible pastures (Fig. 4). As a rule, they distinguish themselves from their neighbors and business partners as a social group (Horrowitz, 1972). Nomads use pasture for which they claim rights of access based on customary law (Bates, 1972). When grazing on private lands, however, the owner of the land is compensated for its use. In addition, barter trade with farmers provides other goods, especially grain, which still provides most of the nomad diet. Nomads traditionally engage in a

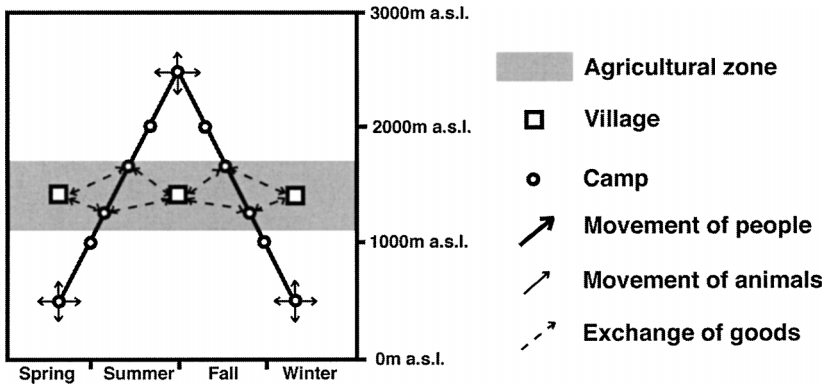


Fig. 4. Schematic diagram of nomadic pastoralism in the Central Zagros.

few side activities beyond animal husbandry, such as transportation, trade, or other services, such as work as guards, guides, or mercenaries. The absence of permanent settlements and village lands results in a mobile society in which moveable property, characterized by a portable black tent (Edelberg, 1966–67; Faegre, 1979; Feilberg, 1944), provides shelter in the grazing grounds.

ARCHAEOLOGICAL SIGNATURES OF DIFFERENT FORMS OF PASTORALISM

The various forms of pastoralism outlined above are primarily based on ethnographic observations and historical records. Using them as a basis, one can devise a set of material markers to identify each strategy in the archaeological record.

Village-based herding is hard to identify positively, because if one has a village with sheep and goat from a range of age–sex categories but no evidence of camps, by default one infers village-based herding. But direct evidence is not easy to find archaeologically.

Since the distance traveled between the village and the pasture is short and the herd usually returns to the village before nightfall, there is little or no need to build temporary shelters or campsites at the pasture. In terms of material culture, what the village-based shepherds usually carry with them in these short journeys is a modest amount of food (usually wrapped in a piece of cloth) and a container made from leather or pottery for beverage, usually water, or occasionally milk or buttermilk. The need for a container may be eliminated if a source of water is known in the pasture. In the most optimistic scenario, if the shepherds do in fact take a pottery jar with them, and the jar does break, our chances of finding a few pieces of surface sherds after millennia seem low. Of course, there is a minor chance of documenting such sherds in a careful pedestrian survey, but we are not yet in a position to differentiate between a herder's lunch and a farmer's lunch.

Perhaps the best place to detect village-based herding is in the village itself. The discovery of pens next to residential quarters can be taken as an indication of keeping herds. Faunal assemblages showing animals of different species and ages is also an indication of herding (Bocherens *et al.*, 2001). Chemical analyses of pottery vessels for residues of dairy products can also provide us with information on pastoral activities (Craig *et al.*, 2000; Dudd and Evershed, 1999). Last, but not least, analysis of dung remains from permanent settlements (Miller, 1996) provides a way to tell where animals were grazing.

Transhumant pastoralism leaves behind a more detectable archaeological signature. One can expect to find transhumant sites between the limits of

the agricultural zone and the boundary of vegetal growth on highland mountains. The need to reside at the pasture for an extended period of time would prompt the herders to build some sort of temporary dwelling in a campsite (Gamble, 1991). This dwelling may show itself in the archaeological record as stone footing for a tent. Not far from the campsite one can also expect to find evidence for ancient pens or corrals, depending on the size of the herd (Cribb, 1991b). Transhumant pastoralists may also use natural features such as caves and rock-shelters as their temporary dwellings or animal pens (Straus, 1997).

Transhumant pastoralism leaves a distinct signature in the material culture. Whether as members of extended households or as wage laborers, herders travel alone or in small groups depending on the size of the herd, but they do not form an independent social group. Therefore, one can expect to see a general pattern in transhumant sites that the material culture does not show the full range of household activities, but only artifacts that represent a limited range of activities associated with herding (e.g., stone tools for sawing wood and cutting fodder, pots for preparation of small amounts of food and storage of food for a short period of time). Further, if herders were members of an extended household, one could expect to see a subgroup of the regional assemblage represented in a transhumant site. In the case of hired herders, since they may come from different communities, one can expect to see material culture characteristic of their respective communities of origin. This may show itself in microstylistic analysis of a regional pottery tradition (if herders come from different villages in the same region), or examples of different pottery traditions (if herders come from different regions). In any case, transhumant pastoralists, whether members of an extended household or hired shepherds, occasionally stop by villages where the owner of the herd resides to exchange goods and receive payment. Therefore, one can expect to see examples of the material culture from permanent settlements finding their way into transhumant sites.

Camps, whether of seminomads or full-fledged nomads, leave the most characteristic signature in the archaeological record (Cribb, 1991b; Edelberg, 1966–67; Gamble and Boismier, 1991). As Hole (1978, 1979, 1980) has suggested, there are several important factors that should be brought into consideration while searching for nomadic campsites.

1. Nomadic campsites should be located with respect to seasonal pastures and to migration routes without regard to arable lands or concern with close major sources of water like rivers. This is usually beyond the limits of agricultural zones and in peripheral areas where nomads can pitch their tents and graze their herd without potential problems or interference with sedentary villagers, but close enough so

they could carry out their exchange of goods without having to travel a distance that may be detrimental to some perishable material such as dairy products.

2. Nomadic campsites should provide evidence of repetitive seasonal occupation.
3. Nomadic campsites should show evidence for small groups of temporary dwellings built with minimum investment of time and labor.
4. Material culture from nomadic campsites should represent a range of activities associated with a self-sufficient household. This should include a whole range of artifacts associated with procurement, processing, and storage of food, as well as domestic production (e.g., textile weaving and basket making), and personal belongings, including ornaments.

Moreover, the bulk of the pottery from a nomadic campsite should be handmade and coarse, something that can easily be made without elaborate firing installations. One can, however, expect to find examples of fine pottery characteristic of the region or other regions along the migratory route, either as social gifts from sedentary people, or as luxurious tableware used by nomads for guests as a gesture of hospitality. Chipped stone from nomadic sites should also be traceable to sources along the migration route. However, in some cases, some chipped stone may find its way to a nomadic assemblage through exchange with sedentary villagers. There is also the possibility that flint may have been supplied to villagers by nomads.

Having defined these archaeological signatures for different strategies of patoralism, we now have a framework within which we can approach the question of early developments of pastoralism in the Central Zagros Mountains through a series of regional surveys and excavations.

CENTRAL ZAGROS MOUNTAINS AND THE EARLY DEVELOPMENT OF PASTORALISM

The Central Zagros mountains (Fig. 5) has been a focus for archaeological research on the early developments of pastoralism and the origins of nomadic pastoralism (Gilbert, 1975, 1983; Henrickson, 1985a; Hole, 1977, 1978, 1979; Mortensen, 1972; Wright, 1987; Zagarell, 1975, 1982, 1989). This can be attributed to a number of factors.

First, the Central Zagros mountains is a vast region of rugged terrains unsuitable for large-scale agriculture, but ideal for different forms of pastoralism, including nomadic pastoralism (Ehlers, 1974), which is still practiced in the region by several groups (Amanollahi-Baharvand, 1989).

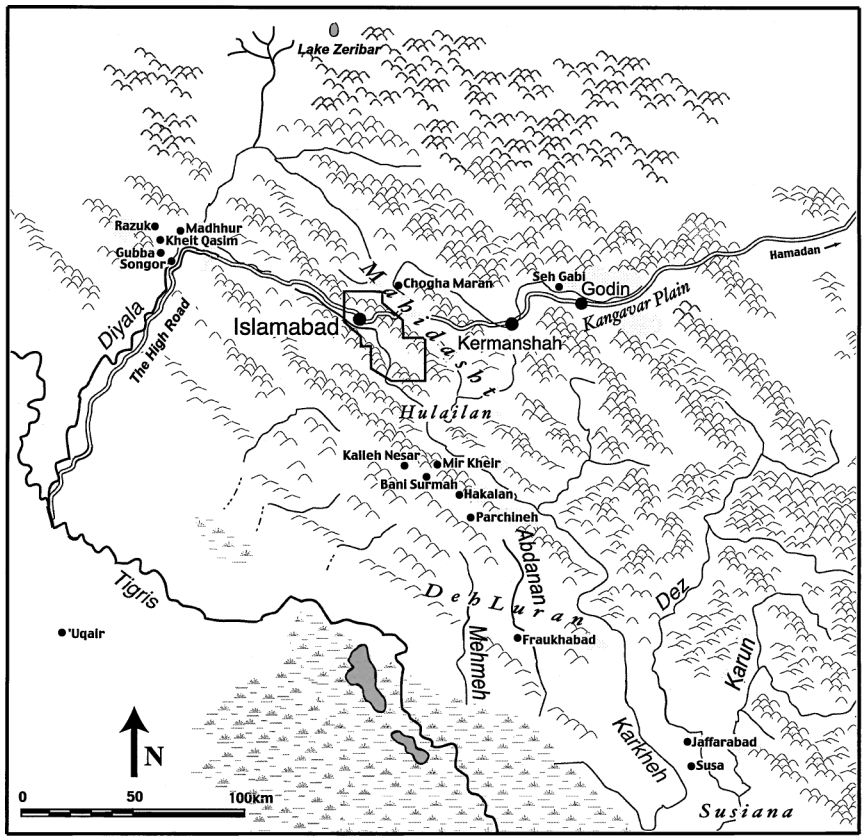


Fig. 5. General map of the Central Zagros and adjacent regions. The marked area along the High Road is the Islamabad Plain (see Fig. 7).

Second, the Central Zagros mountains seem to have been the natural habitat of the wild ancestors of the domesticated caprines (sheep and goat), commonly associated with pastoralism in the Near East. Sheep (*Ovis aries*) appear to have been domesticated during the Epipaleolithic–Early Neolithic period in multiple locations in the Near East including the Levant (Horwitz *et al.,* 1999; Peters *et al.*, 1999), and perhaps in the Zagros foothills (Uerpmann, 1987). However, in the latter region, sheep seem to have declined in importance compared to their wild ancestors in earlier periods (Hole, 1996; Legge, 1996), suggesting that in the Zagros early herding of caprines focused not on sheep but on goat.

Goat (*Capra hircus*) is the herd animal immediately associated with pastoralism, especially nomadic pastoralism. The goat's wild ancestor, the

Persian wild goat or bezoar (*Capra aegagrus*) is native to the rugged mountain terrains of the Central Zagros where recent reanalysis of faunal remains (Zeder, 2001; Zeder and Hesse, 2000) place the domestication of the goat sometime in the Epipaleolithic–Early Neolithic period.

Semiarid environments and strong seasonality in rainfall make the mountainous regions of the Near East, including the Zagros, best suited for herding of small stock, particularly sheep and goats. Complementary patterns of selective grazing by sheep and indiscriminant browsing by goats (Johnson, 1969; Nyerges, 1980; Spooner, 1972) make this combination of species a useful one in terms of both productivity and stock management (Redding, 1981, 1984). Sheep's tendency toward flocking (Garrard, 1984) is exploited by pastoralists to concentrate animals in manageable units, while the higher agility and intelligence of goats make them useful as flock leaders (Nyerges, 1980).

Third, the Central Zagros has yielded some of the earliest remains of what archaeologists believe to be evidence for people pursuing a nomadic pastoralist way of life. These include a number of sites described as temporary pastoralist campsites (Hole, 1978, 1979, 1980; Mortensen, 1972, 1976; Zagarell, 1982), as well as isolated cemeteries commonly attributed to nomadic groups (Haerinck and Overlaet, 1996; Vanden Berghe, 1987). What has led archaeologists to argue that these sites are pastoralist camps is their peripheral location, which makes them unsuitable for agricultural activities, but appropriate for pastoral exploits. Cemeteries, on the other hand, have been attributed to nomadic people because no evidence for permanent settlement has been discovered in their vicinity and they are located along nomadic migratory routes.

Fourth, early written documents from Mesopotamia suggest the presence of a well-established nomadic component in the Zagros, perhaps as early as 4500 B.P. with whom sedentary Mesopotamians maintained a complex social, economic, and political interaction that usually operated smoothly, but occasionally erupted into open hostilities (Adams, 1974; Edzard, 1981; Rowton, 1973a,b, 1974, 1977; Vardiman, 1977).

Fifth, the paleoecological evidence from the Central Zagros is suggestive of expansion of pastoralist activities from the Neolithic period to the Bronze Age. Most importantly, the pollen diagrams from Lake Zeribar (van Zeist, 1967; van Zeist and Bottema, 1977) provide some clues on floral changes in the area from the colder, drier early Holocene to the warmer, wetter middle Holocene. Of the pollen diagrams published for Lake Zeribar (van Zeist and Bottema, 1977, fig. 24), Zones 5b, 5c, and 6 from pollen core I and II can be attributed to the Middle Neolithic to the Middle Chalcolithic periods (Fig. 6). In Zone 5b, one can see an increase in oak pollen, while later, in Zone 5c, there is a sharp drop to half the previous level, while pistachio

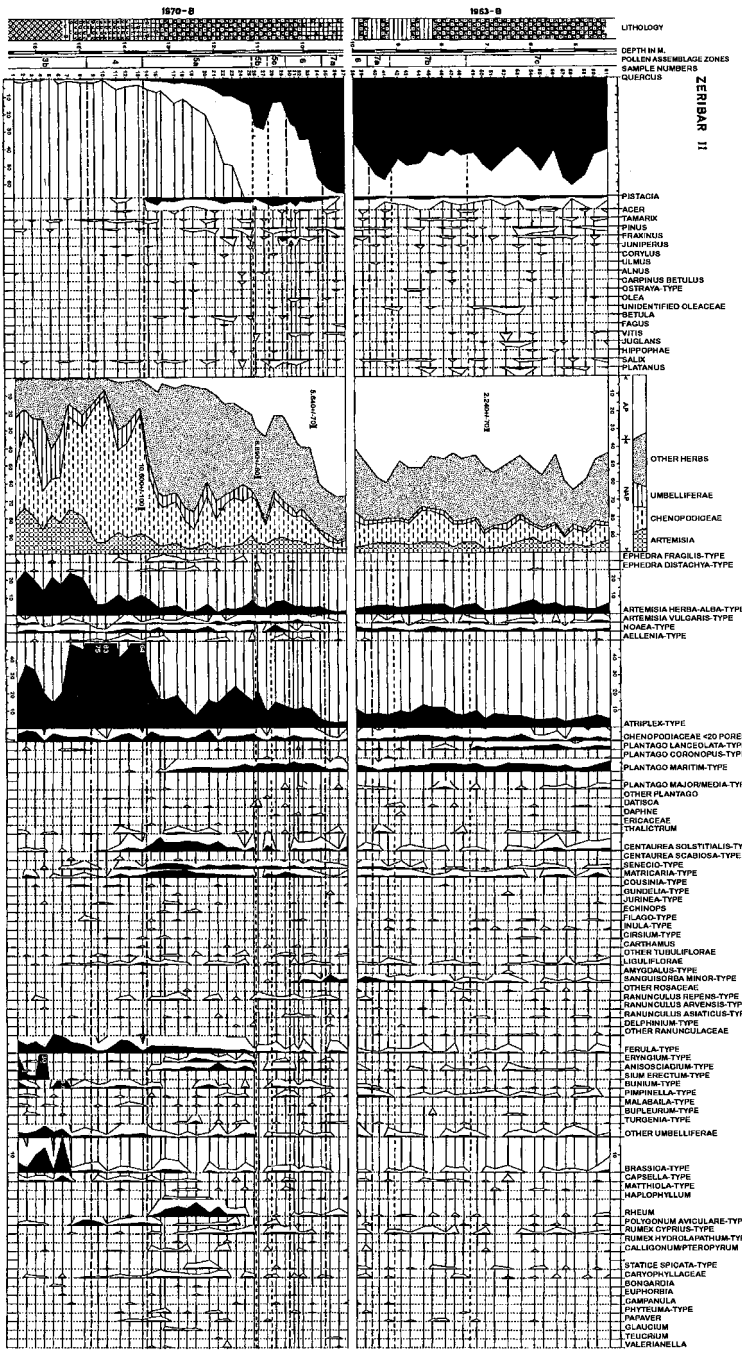


Fig. 6. Pollen diagram from Lake Zeribar (after van Zeist and Bottema, 1977, fig. 24, with some modification).

and ash (both quality woods suitable for making bows and arrows and other tools) increase. Later in Zone 6, oak increases to 3–4 times more than its level in earlier Zone 5c.

What stands out in terms of differences in vegetation related to pastoralism in Zones 5b/c and 6 is the genus used for fodder and the genus indicating overgrazing. Most importantly, in Zone 5c one can see a radical increase in *Rumex*, a common fodder, while with Zone 6 there is a sudden increase in *Sanguisorba minor*, a common indicator of overgrazing. Another indication of overgrazing in Zone 6 is the fairly frequent occurrence of Rheum and *Anisosciadium*. These tragacanthic plants enter various Artemisia and even segetal habitats, indicating the lack of competition resulting from overgrazing (Zohary, 1973, p. 491).

In summary, conditions for grazing were excellent during much of the Middle Chalcolithic period, but at the end of this period, there is evidence for general deterioration of the climate (van Zeist and Bottema, 1982, 1991) and overgrazing.

THE FIELD RESEARCH

The area around the High Road (also known as "the Great Khorasan Road" in Medieval times) in the Central Zagros (Fig. 5) was a focus of archaeological research in the Near East from the early nineteenth century to the late 1970s, furnishing us with much information on societies in the region from the Paleolithic times to the Islamic period (Hole, 1987c). The Iranian Revolution of 1979 and the ensuing Iran–Iraq War of 1980–88 brought systematic archaeological research in western Iran, including the Central Zagros to a halt. Since the Iranian Revolution, thanks to publications of old survey and excavation reports, as well as a multitude of synthetic studies, our knowledge of early socioeconomic and political developments in other parts of the Near East, especially southern and northern Mesopotamia and the Susiana and Deh Luran Plains has dramatically increased, yet so important a region as the Central Zagros remained poorly explored. After a gap of more than two decades in systematic archaeological research, I carried out four seasons of fieldwork in the Islamabad (formerly Shahabad) Plain in the West Central Zagros Mountains between 1998 and 2001 (Abdi, 1999a,b, 2000, 2001a,b, 2002, 2005; Abdi *et al*., 2002a,b; Biglari and Abdi, 1999; Heydari, 2001; Mashkour and Abdi, 2002).

The Islamabad Plain (Fig. 7) is a roughly 1500 km^2 mountain plain in the folded zone of the Central Zagros Mountains, about 60 km west of Kermanshah, halfway between the Zagros foothills around Qasr-i Shirin and the passes over the central spine of the Zagros and on to the Central Plateau

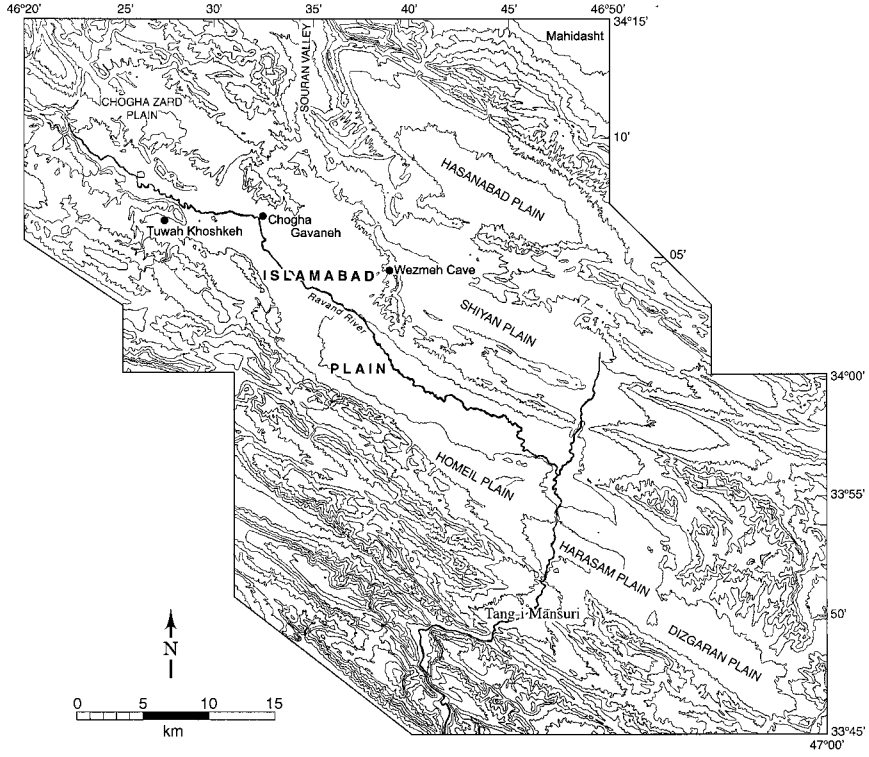


Fig. 7. Map of the Islamabad Plain with the location of major sites mentioned in the text.

of Iran near Asadabad. Formed from a number of smaller plains and valleys somewhat separated from each other by rocky ridges, the Islamabad Plain nonetheless forms a coherent physiographic area and a single hydrographic unit dependent on the Ravand River, the most important water supply in the area to which all other sources, including smaller tributaries and streams from springs flow. The Islamabad Plain is the first large agricultural plain along the High Road in the highland, summer pasture areas (*sardsir*) of the Zagros Mountains. Favorable climate, fertile soil, and ample water have made the Islamabad Plain one of the agriculturally more productive and heavily populated areas in the Zagros Mountains in recent times. Moreover, extensive pastures and a strategic position between highland and lowland pastures along the High Road have made the Islamabad Plain an important way-station along the migration routes of contemporary pastoral nomads.

My research in the Islamabad Plain was focused on socioeconomic developments from the Neolithic period to the Bronze Age (Fig. 8), especially

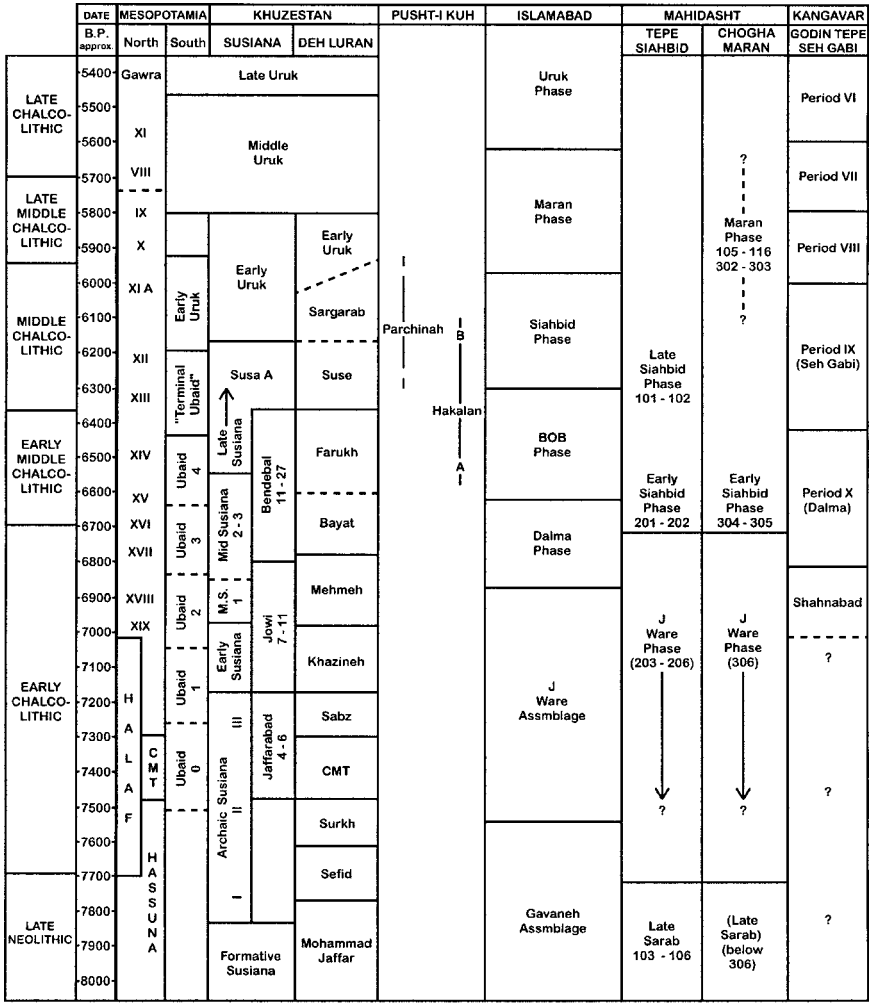


Fig. 8. Comparative chronology of the Central Zagros and adjacent regions (after Henrickson, 1985a, Fig. 21, with some revisions and modifications).

early forms of pastoralism as a prelude to the emergence of full-fledged nomadic pastoralism in the region, presumably by the Late Chalcolithic period to Early Bronze Age (Abdi, 2002). My fieldwork included an intensive survey of the plain (Abdi, 1999a), stratigraphic excavations at Chogha Gavaneh (the site with the longest history of Holocene occupation on the plain) (Abdi, 2005), excavations at the campsite of Tuwah Khoshkeh (Abdi *et al.*, 2002b;

Mashkour and Abdi, 2002), and excavations at the cave-site of Wezmeh (Abdi *et al*., 2002a).

The Survey Evidence

In four seasons of survey in the Islamabad Plain (Abdi, 1999a) we recorded a total of 190 sites ranging in date from a late Early to early Middle Paleolithic open-air site (Biglari and Abdi, 1999) to several recent cemeteries. The majority of these sites date to the later historical and Islamic periods, but we believe we also recorded a representative sample of sites of earlier periods, especially the Neolithic and Chalcolithic period, sufficient to furnish us with an outline of the settlement history of the Islamabad Plain in these periods that concern us in this study. In the following section, we shall focus on the settlement pattern of the Neolithic and Chalcolithic periods to trace the changes in settled area (Fig. 9), settlement history, and to document the shift from a sedentary to nomadic occupation in the Islamabad Plain.

The Early (Aceramic) Neolithic Period

Only three sites dating to the Early (Aceramic) Neolithic are recorded: ID1 (or, more simply "1") (Chogha Gavaneh), 48 (Chia Baft), and 117 (Chia Jani) (Fig. 10). On the basis of their size, height, and location along a major river, four more sites (39, 64, 78, and 168) may also have Early (Aceramic) Neolithic occupation in their basal levels, but this cannot be confirmed based on surface remains.

Of the three Early (Aceramic) Neolithic sites, two (1 and 117) are located along major watercourses; 1 along the Ravand River and 117 along the Qouchemi stream leading to the Ravand River about 3 km to the south. ID48 is today less than 1 km to the east of a major bend of the Ravand River in the alluvial plain, but on aerial photographs one can see traces of at least two shifts in the course of the river, both coming very close to the site. These three sites, all 1 ha or smaller, represent the earliest phase of sedentary occupation on the Islamabad Plain.

The Middle Neolithic Period

By the Middle Neolithic, there was an increase in the number of sites to 10 (Fig. 11). ID1, 48, and 117 all continue to be occupied. In addition, seven new sites are established, all along the Ravand River or its tributaries on the alluvial plain. ID70 was perhaps founded to benefit from the cluster of

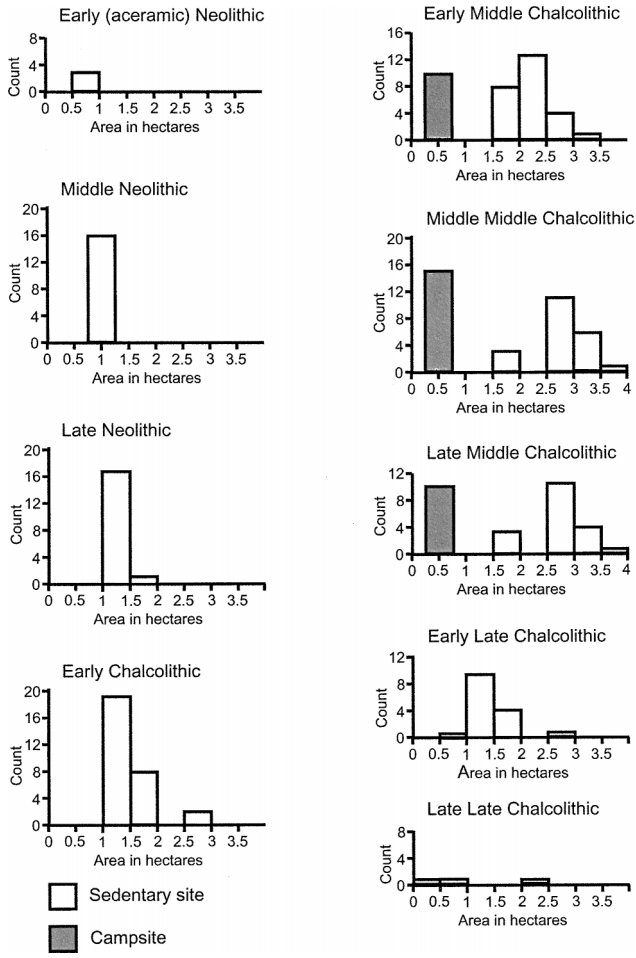


Fig. 9. Size distribution of sites from Early (Aceramic) Neolithic to the end of the Chalcolithic period.

springs and fertile soils in the Sarab-e Arkavazi area. Further downstream, a series of almost equidistant settlements were founded along the Ravand River, namely ID62, 39, 41, and 64. The only gap is about 10 km between ID41 and 64. ID168, although distant from the Ravand River, could have been sustained by water from a stream coming from a major spring 3 km away. Another newly founded site (ID78), although in the relatively dry Shiyan Plain, is nonetheless strategically located on the piedmonts between the Mileh Sar and Shiyan springs.

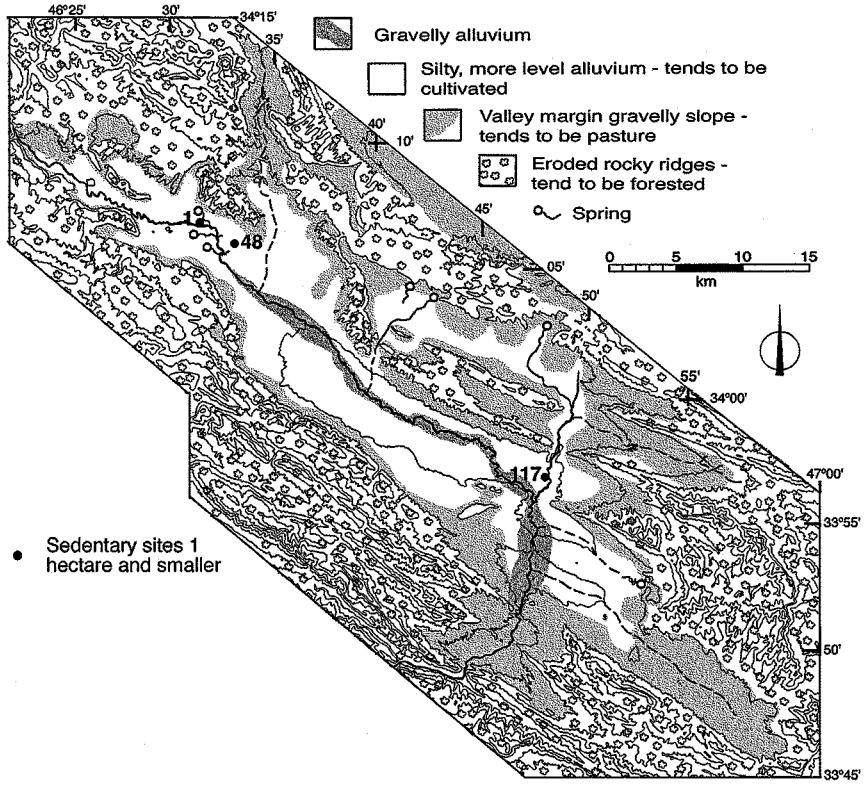


Fig. 10. Settlement pattern of the Early (Aceramic) Neolithic period.

The Middle Neolithic sites in both the upstream grouping and downstream grouping are all relatively small mounds of 1 ha or less (see Fig. 9) within the expected size range for small villages with 100–200 inhabitants.

The Late Neolithic Period

By the Late Neolithic period, there was an increase in the number of sites to 18 (Fig. 12). Only one site (117) was abandoned, but other sites continued to be occupied and expand in size. Further, nine new sites were founded. Of these, two (8 and 153) are strategically located to take advantage of previously unoccupied areas: the fertile Firuzabad Plain to the northwest and the threshold of Tang-e Mansouri to the southeast, respectively.

A new site (69) in the Sarab-e Arkavazi area, in addition to the previously occupied ID70, suggests that people were pushing their use of the

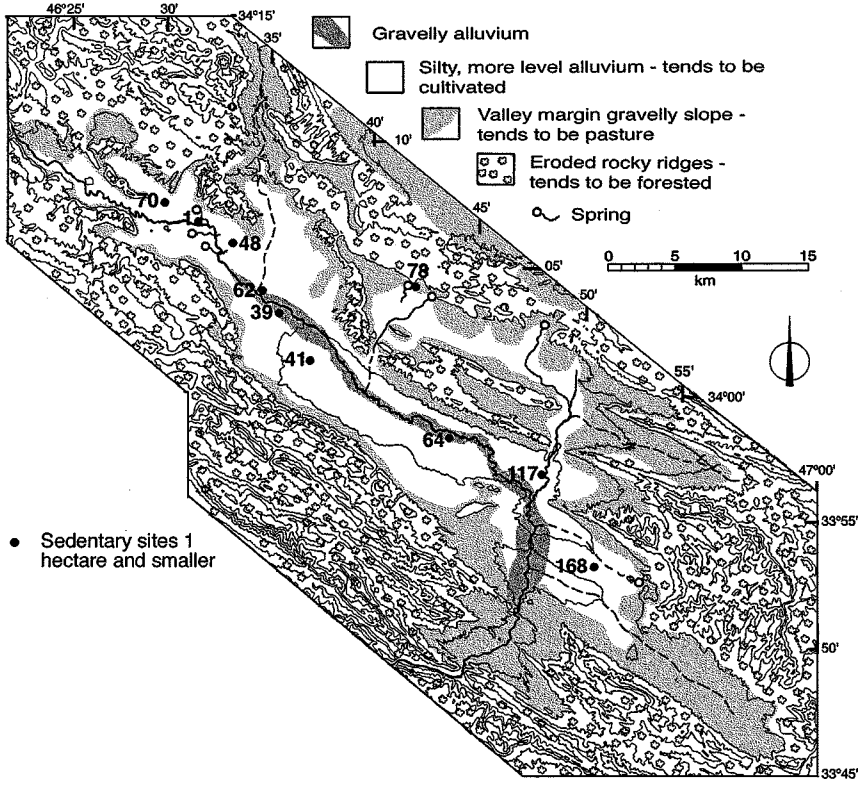


Fig. 11. Settlement pattern of the Middle Neolithic period.

major sources of water in this area. Other new sites are ID26, 40, 42, 46, 111, and 167. ID40 and 111 are located along the Ravand River; ID111 in particular, in the gap between ID39 and 64, suggests an expansion of agricultural activities. ID26, 41, 42, and 46, although a few kilometers away from the Ravand River, are all within the alluvial plain, where dry-farming was perfectly feasible in wetter Late Neolithic times. Further, ID26 is located along a seasonal stream coming down from the higher elevation Souran Valley, perhaps providing water during warmer seasons. For both ID41 and 42, the slope of the ground seems right for small canals and one can see some traces of canals on the aerial photographs and detailed topographic maps. ID46, however, is on a higher slope, and water must have come from a seasonal stream flowing from the southern slopes into the Plain and ultimately into the Ravand River. Another new site (167) further to the north of 168 could also have used the water from the nearby spring.

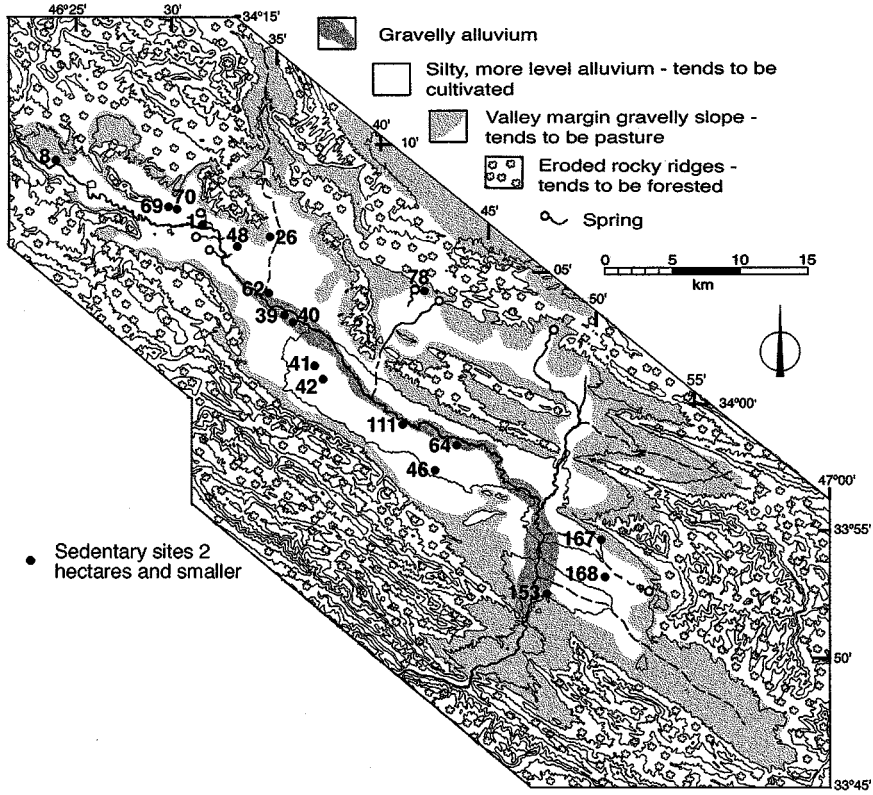


Fig. 12. Settlement pattern of the Late Neolithic period.

All the Late Neolithic sites are roughly 2 ha or smaller (Fig. 9). There might have been a slight size difference between old and newly established sites, but it is doubtful this had any meaningful sociopolitical significance. There is no indication in the types of ceramics or stone tools of any social difference between these sites, but one should bear in mind that at all of them earlier occupation is covered by later deposits, and the interpretation of scant surface remains is difficult.

The Early Chalcolithic Period

The Early Chalcolithic period in the Central Zagros is characterized by J-Ware, a well-crafted and fine pottery, usually compared to the Halaf tradition of northern Mesopotamia and taken to indicate influx of people

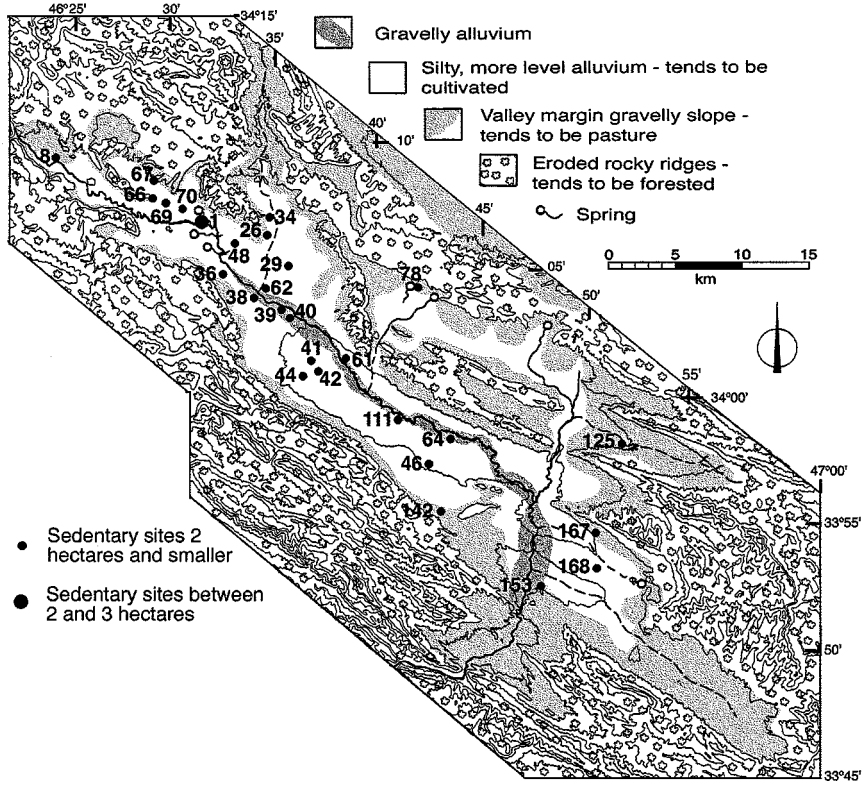


Fig. 13. Settlement pattern of the Early Chalcolithic period.

from the latter region into Central Zagros (Henrickson, 1983, 1986; Hole, 1987a,b; Levine and Young, 1987).

By the Early Chalcolithic period, the number of sites increased to 28 (Fig. 13). All the sites of the previous period continue to be occupied and to expand in size. There are 10 new sites. Of these, two (66 and 67) are located in the Sarab-e Arkavazi area, thus suggesting an increase in agricultural activity taking advantage of the major springs in this area. Three, ID36, 38, and 61, are located along the Ravand River, suggesting further expansion of agricultural regime using water from the river. ID29, 34, 125, and 142 are new foundations, all four small sites at some distance from the Ravand River. ID29 is a small site in the dry-farming zone and not in the immediate vicinity of any source of water, thus suggesting a seasonal occupation. ID 34, however, is located not far from a semipermanent stream flowing down the Souran Valley. ID125, also a rather small site, may have been another

seasonal occupation, taking advantage of seasonal streams in an unexploited area. The last four sites may have been seasonal hamlets for agricultural activities during wetter seasons.

By the Early Chalcolithic, there is a subtle two-tier site-size variation (see Fig. 8), with one major sedentary site (ID1) of about 2–3 ha and smaller sites of 2 ha and less. By this time, ID1 (Chogha Gavaneh) seems to have become a center in the plain. The clustering of smaller sites in the western part of the plain probably relates to both the less intensive survey and the damaging effects of a large late historic – early Islamic town and leveling and agricultural activities in the eastern part of the Plain. This first evidence of settlement hierarchy together with small groups within the Plain and with suggestions of small canals in this period parallel the contemporary Khazineh Phase in Deh Luran plain (Hole *et al*., 1969; Neely and Wright, 1994) and the Early Middle Susiana period on the Susiana plain (Hole, 1985).

The Middle Chalcolithic Period

My analyses of the Middle Chalcolithic settlement pattern relied on a refined typology of the Middle Chalcolithic period (Abdi, 2002; see also Henrickson, 1983; Levine and Young, 1987). Briefly, the Early Middle Chalcolithic (EMC) period is characterized by three wares: Dalma Impressed, Red-Slipped, and Dalma 'Ubaid, in addition to some Zagros Black-on-Buff (BOB). In the Mid-Middle Chalcolithic (MMC), the Dalma-related wares disappear, to be replaced by a higher frequency of BOB. By the Late Middle Chalcolithic (LMC), BOB falls in frequency in favor of a Red-White-and-Black Ware and smaller quantities of Black-on-Red Ware, both of which continue to the Early Late Chalcolithic period.

In ascribing sites to successive phases of the Middle Chalcolithic, I focused on the only ware that seems to have had some time depth in the Zagros: the Red-Slipped Burnished Ware. Wares of similar fabric and general surface treatment were common in the Islamabad Plain from the Late Neolithic times, and there seems to have been a prolonged continuity in the general red-slipped tradition well into the Late Chalcolithic period. Detailed analyses of the Red-Slipped Burnished Ware indicates that a temporal continuum can be devised for this ware based on fabric and surface treatment, as both show some development from the Late Neolithic to the Late Chalcolithic period: the fabric became more dense and the surface more burnished, until burnishing disappeared after Early Middle Chalcolithic times. I therefore tentatively assume that sites with both Red-Slipped Ware and BOB should be dated to EMC to MMC, a higher frequency of Red-Slipped Ware indicating an EMC date, while higher frequency of BOB indicating a MMC date.

Sites with the highest frequency of BOB indicate a MMC date. A decreasing frequency of BOB and increasing frequency of RWB and BOR indicate a LMC date. On the basis of these assumptions, the settlement pattern of the consecutive phases of the Middle Chalcolithic period is as follows.

The Early Middle Chalcolithic Period

By the Early Middle Chalcolithic period, the number of sites increased to 37 (Fig. 14). At 3.5–4 ha in area, ID1 (Chogha Gavaneh) is now the dominant center of the Plain (Fig. 9). All the major sites of the Early Chalcolithic period continue to be occupied and to expand in size, except ID62, which was abandoned, perhaps in favor of 38 across the River. All 11 new sites seem to be temporary campsites beyond the agricultural zone in the peripheries of the plain more toward areas where one can expect to find pastures, but none

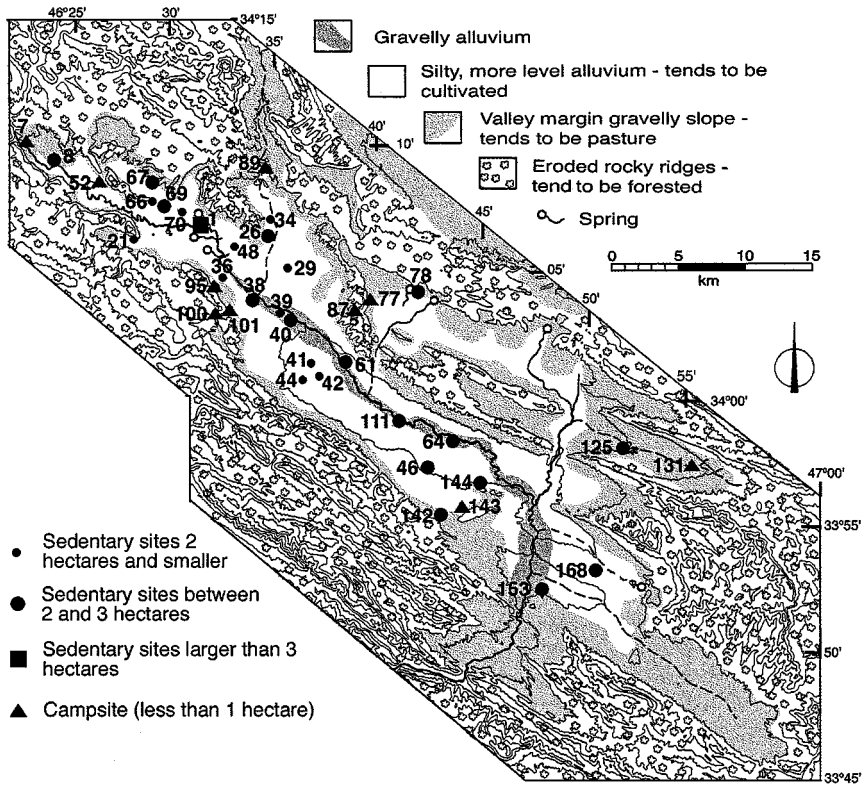


Fig. 14. Settlement pattern of the Early Middle Chalcolithic period.

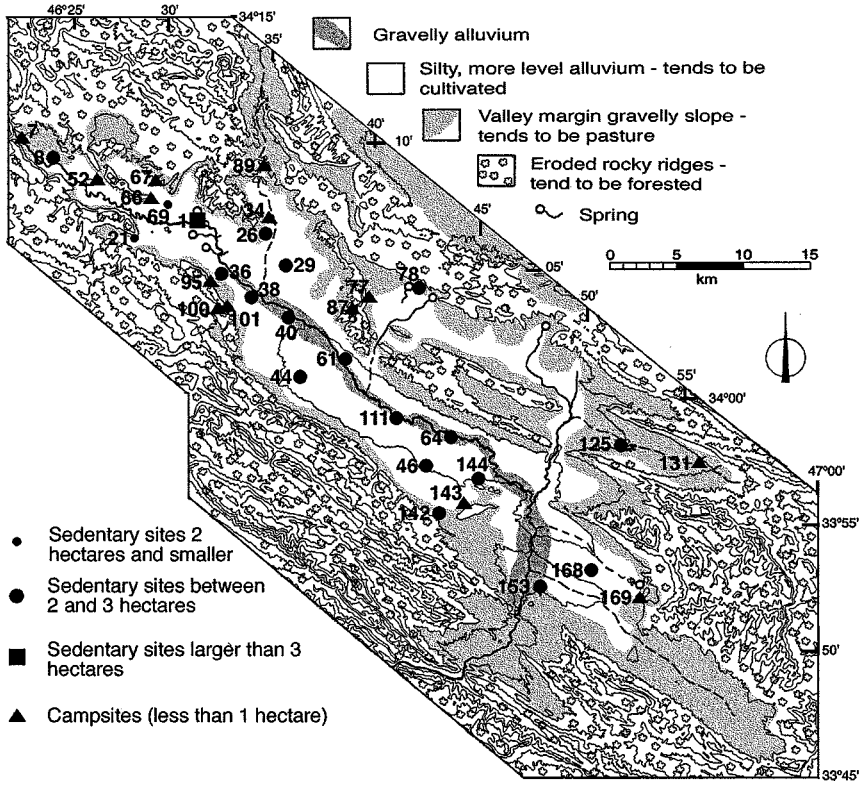


Fig. 15. Settlement pattern of the Mid-Middle Chalcolithic period.

is more than 5 km from a permanent site, suggesting an increasing reliance on distant village-based herding.

The Mid-Middle Chalcolithic Period

In the Mid-Middle Chalcolithic period, the number of sites dropped to 36 (Fig. 15). Despite a minor change in the number of sites, settlement patterns show major change. ID1 is still the dominant center of the Plain, but there is a major change in the Sarab-e Arkavazi area. After a subtle increase throughout the Neolithic and Early Chalcolithic period, one site in the area (70) is abandoned, while the other three (66, 67, and 69) shrink in size. Further down the Ravand River, several smaller sites were abandoned, while the neighboring permanent sites expanded, suggesting an emigration of people from smaller to larger sites. Two main examples of this process can

be seen in abandonment of 39 and expansion of 40, and abandonment of 41 and 42 and an expansion of 44. All the campsites from the Early Middle Chalcolithic period continue to be used. Further, a new campsite (169) was founded in the southeastern sector of the Plain, perhaps serving 168.

The Late Middle Chalcolithic Period

By the Late Middle Chalcolithic, the number of sites dropped to 27 (Fig. 16). All the occupied sites show a decrease in size (Fig. 9). Further, a number of sites were abandoned, most notably 44, perhaps as a result of decline of the agricultural system. Campsites to the east of the Plain are all abandoned, while a few continue to operate to the west and north, along migratory routes connecting the Plain to neighboring plains, suggesting mobile pastoralist movement on a larger scale.

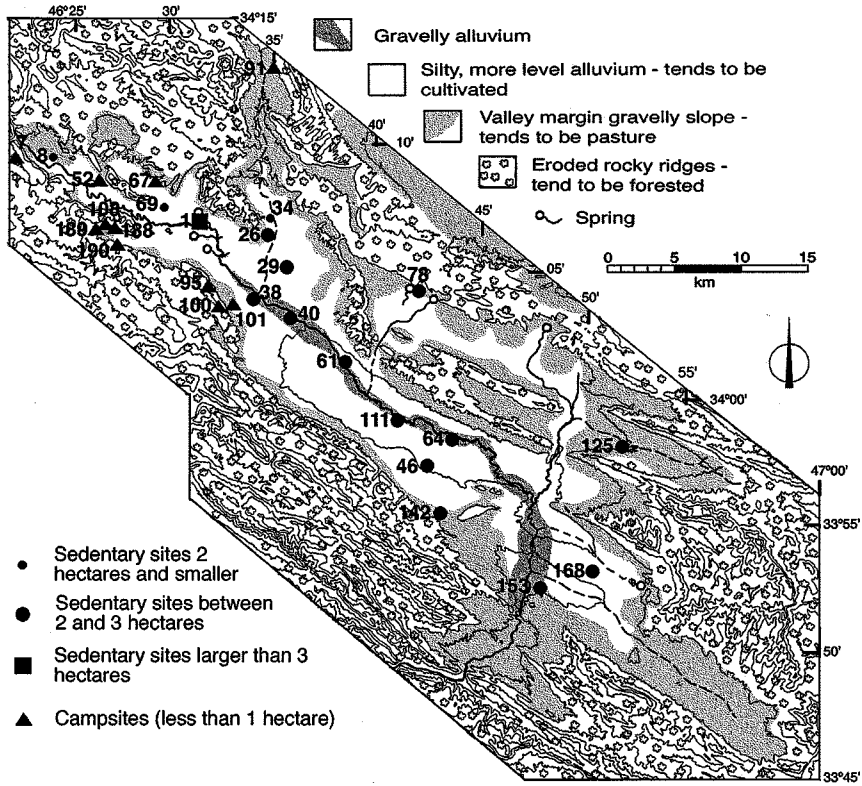


Fig. 16. Settlement pattern of the Late Middle Chalcolithic period.

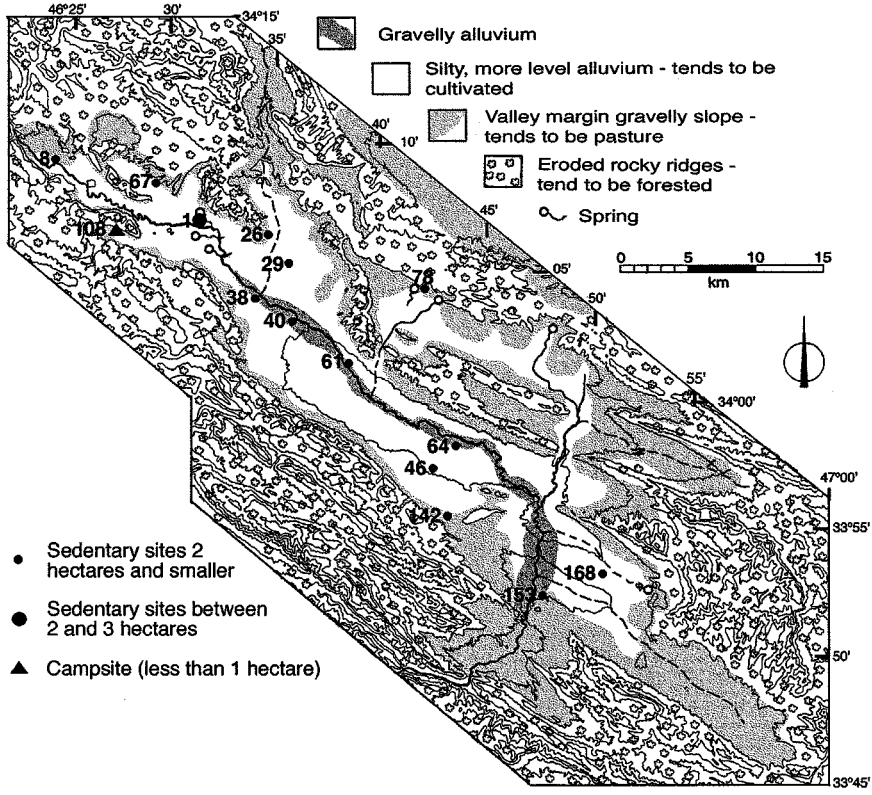
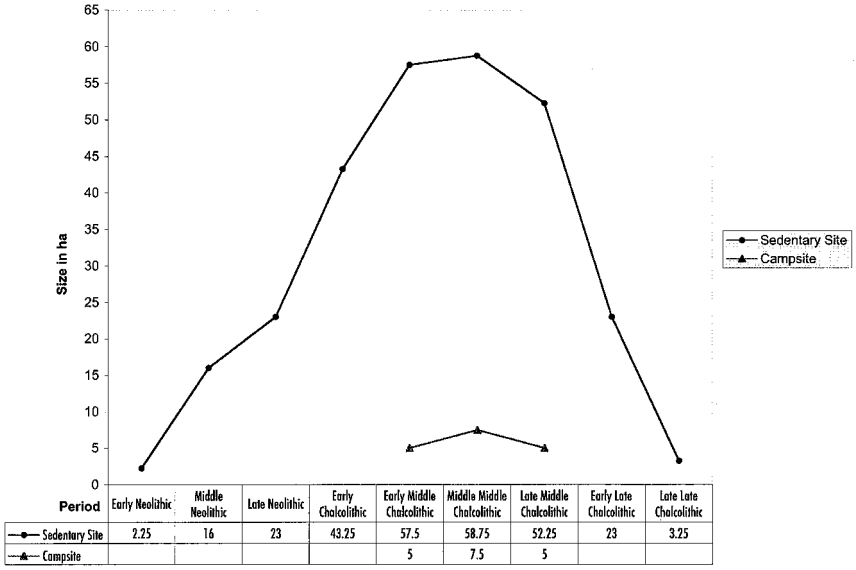


Fig. 17. Settlement pattern of the Late Chalcolithic period.

The Late Chalcolithic Period

In the Late Chalcolithic period, the decline in settled area continues (Fig. 17). Only 14 sites remain, all much smaller than the previous period. No campsite can be securely dated to this period.

The latter half of the Late Chalcolithic in the Islamabad Plain corresponds to the Middle and Late Uruk period in the lowland plains to the southwest. In our exploratory step trench at Chogha Gavaneh (ID1), we discovered a trash deposit with typical Uruk pottery, suggesting that an Uruk enclave like the one excavated at Godin Tappeh V (Weiss and Young, 1975) may have existed at Chogha Gavaneh. Apart from Chogha Gavaneh, the only reliable Uruk find is a piece of beveled-rim bowl from Wezmeh Cave. Another possible Uruk sherd was picked up from the surface of ID153, but an Uruk occupation at the site cannot be supported with any degree of certainty.



Period	Early Neolithic	Middle Neolithic	Late Neolithic	Early Chalcolithic	Early Middle Chalcolithic	Middle Middle Chalcolithic	Late Middle Chalcolithic	Early Late Chalcolithic	Late Late Chalcolithic
Sedentary Site	2.25	16	23	43.25	57.5	58.75	52.25	23	3.25
Campsite					5	7.5	5		

Fig. 18. Site-size from Early Neolithic to Late Chalcolithic period.

Evaluation of the Survey Evidence

The survey evidence suggests that the settlement pattern in the Islamabad Plain developed in several significant ways during the Neolithic and Chalcolithic periods (Fig. 18). As one would expect, sedentism emerged in the Early Neolithic period along major watercourses, gradually expanding to the rest of the alluvial plain by the Middle and Late Neolithic period. This trend continued in the Early Chalcolithic period. In this period, if not before, larger centers developed, and there is some indication of small-scale irrigation. The number of villages increased substantially at the end of the Early Chalcolithic, reaching its peak in the Early Middle Chalcolithic period, suggesting the expansion of the agricultural regime to its maximum capacity, a hypothesis supported by some evidence for small-scale canals.

Then, in the Late-Middle to Late Chalcolithic, the trend was abruptly reversed and the number of permanent settlements dropped precipitously in favor of temporary campsites with increasing distance from the agricultural zone. This suggests growing dependence on mobile pastoralism by exploiting pastures in other environmental niches in the Plain. What stands out in the Middle and Late Middle Chalcolithic is the increasing distance between sedentary villages and campsites, suggesting a gradual shift from proximate-village herding to distant-village herding and to transhumant pastoralism.

Excavations

Excavations at Chogha Gavaneh

In the first and second seasons of fieldwork (1998–99), I carried out some small-scale stratigraphic excavations at Chogha Gavaneh—the site with the longest history of Holocene settlement which, with around 3 ha of occupation, appeared to be the largest Chalcolithic site on the Plain. One of the stratigraphic cuts—Operation W263—exposed Late Neolithic to Late Middle Chalcolithic deposits (Abdi, 1999b, 2005). These excavations, although small in scale, yielded direct evidence of (1) subsistence in the form of domesticated plants (e.g., wheat, barley, chickpeas) and animals (e.g., sheep, goat, cattle, pig); (2) social activities in the form of clay figurines and ceramics rich in painted decoration; (3) craft activities in the form of stone tools; and possibly (4) administrative activities in the form of a stamp seal and tokens. These findings indicate that the Middle Chalcolithic sedentary community at Chogha Gavaneh was a fairly complex society with considerable inter- and intracommunity interaction.

What seemed striking in excavations at Chogha Gavaneh was the diversity of the pottery recovered compared to that found on the surface of other Middle Chalcolithic sites on the Plain. The pottery found during surface surveys belongs to local Zagros Chalcolithic Black-on-Buff, Red-White-and-Black, and Black-on-Red (Levine and Young, 1987), while in Operation W263 at Chogha Gavaneh, in addition to the local Zagros Chalcolithic ceramics, there was a considerable number of sherds characteristic of other areas. These included various types of Dalma Ware, representing a ceramic tradition extending from Azarbaijan to Central Zagros (Henrickson and Vidali 1987); Black-on-Buff pottery typical of the Deh Luran and Susiana Plains in the lowlands of southwestern Iran (Delougaz and Kantor, 1996; Dollfus, 1983a,b; Hole *et al*., 1969; Le Breton, 1957); and 'Ubaid pottery of southern Mesopotamia (Oates, 1983; Safar *et al*., 1981; Ziegler, 1953). This is also true for the lithic material from excavations at Chogha Gavaneh, as we found cherts perhaps coming from the Southern Zagros, Deh Luran, and the Middle Euphrates, and also obsidian, which perhaps came from Anatolia (Wright, 2005).

The discovery of sherds and lithics from remote areas in Middle Chalcolithic deposits at Chogha Gavaneh suggested, among other alternatives such as exchange, the presence of a mobile component in the Middle Chalcolithic population of the Islamabad Plain responsible for transporting such items over long distances, an inference supported by the survey evidence discussed above. In the third season in the Spring of 2000, I therefore investigated the mobile pastoralist component of the Middle Chalcolithic population in the

Plain. In April 2000, I revisited every small Middle Chalcolithic site recorded in preceding seasons and, after assessing the archaeological preservation and logistical access for the fieldwork, selected Tuwah Khoshkeh as the optimal site for test excavations.

Excavations at Tuwah Khoshkeh

Tuwah Khoshkeh is a small site on a natural hill slope in the Tuwah Khoshkeh Plain about 10 km west of the town of Islamabad (Fig. 7). In a short season in June 2000, we opened three exploratory trenches at the site (Abdi *et al.*, 2002b). In the main one, we found two superimposed levels of occupation with at least one irregular ovoid-shaped structure with stone foundations (Fig. 19) that seems to be the remains of one component of a campsite. Another exploratory trench revealed several layers of superimposed stone alignments that may belong to similar structures. The Deep Sounding, on the other hand, suggests that the site may have been used on a temporary (perhaps seasonal) basis for a relatively short period, an inference supported by studies of the faunal remains.

A comparison of faunal remains from Chogha Gavaneh and Tuwah Khoshkeh (Mashkour and Abdi, 2002) shows a diversified exploitation of animal products at Chogha Gavaneh, while Tuwah Khoshkeh seems to represent a more specialized form of pastoralism. Further, analysis of metrical data suggests that there was a differential exploitation of caprine herds at Tuwah Khoshkeh. This may be an indication of the seasonal occupation of the site, since young animals are better represented in the caprine remains. Because of severe winters, modern shepherds in the Zagros only allow sheep to give birth during the spring. If milk is an objective of herding, young males are slaughtered within the first 6 months, depending on the techniques used to prevent suckling (Digard, 1981). Thus, given these different approaches, it can be assumed that Tuwah Khoshkeh was occupied during the summer. It is interesting that the valley is still used today as a stopping place for mobile pastoralists in the summer.

The material culture from Tuwah Khoshkeh was also rather limited and suggestive of the function of the site. The pottery has a narrow range of forms and larger vessels associated with production and storage of food for larger numbers of people is missing. Further, the lithic assemblage consists of primary tools used for a limited range of activities, or tools used for reaping and butchering. One should especially consider the narrow (1–3 mm) stripes of polish on some blades, suggesting that they were used for reaping wild cereals and grass (Korobkova, 1999). This in itself may point to provisioning of fodder for the flock rather than full-fledged agricultural activities. More important is the absence of any processing tools (grinding slabs, mill stones,

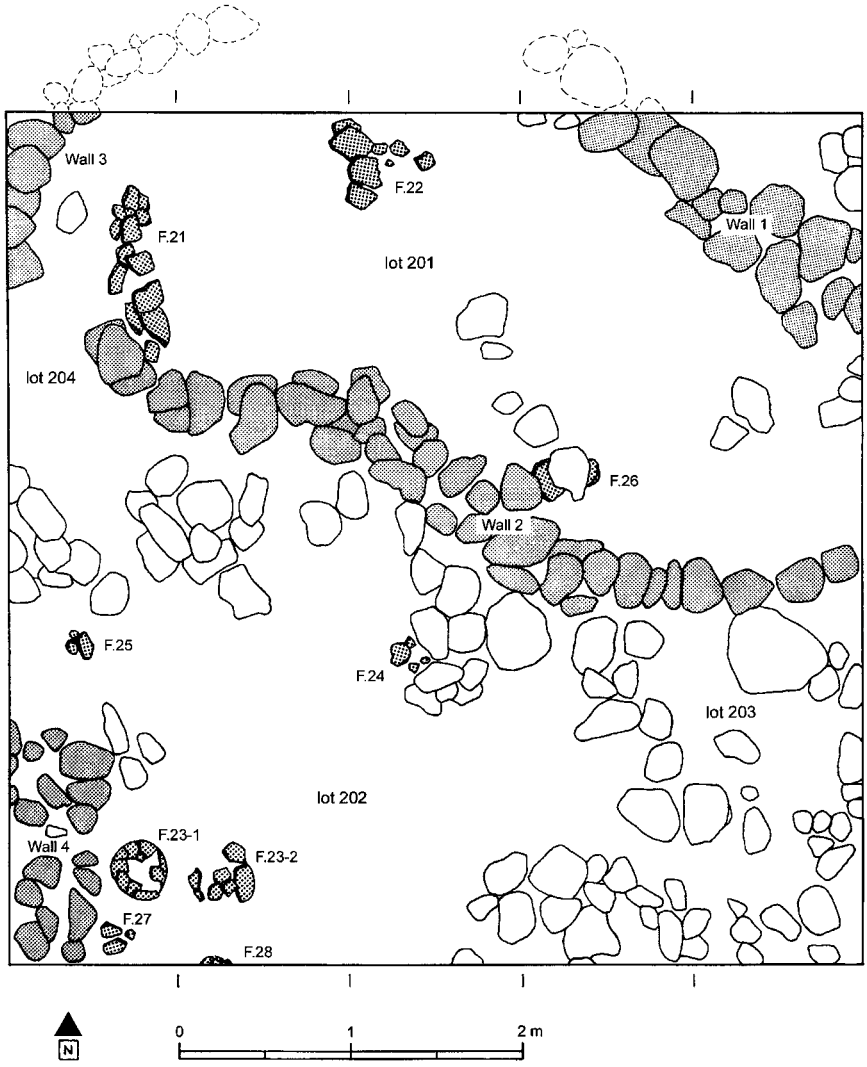


Fig. 19. Excavated features and stone alignments in Layer II, Operation A, Tuwah Khoshkeh.

querns, abraders, pounders, etc.) that one would expect to see associated with a self-sufficient nomadic household, even one dependent on some agriculture as well as on pastoralism.

On the basis of the evidence from excavations, we therefore interpreted Tuwah Khoshkeh as a temporary campsite occupied by transhumant

pastoralists during the Middle Chalcolithic. These people were most likely taking the flocks away from agricultural fields in the alluvial plain to grazing fields in more peripheral areas. As indicated by material culture, the herders did not consist of entire households, but a few members of one or more households from a nearby village. During their residence at Tuwah Khoshkeh, which may have ranged from a few days to a few weeks, these herders were evidently exploiting the local resources not only by providing fodder for their flock, but by hunting wild deer and boar.

Excavations at Wezmeh Cave

When excavations confirmed our interpretation of Tuwah Khoshkeh as a transhumant campsite, we turned to testing our hypothesis that the Middle Chalcolithic mobile pastoralists used a number of caves and rock-shelters as temporary occupations. For this we turned to Wezmeh Cave, about 12 km southwest of the town of Islamabad-e Gharb in a small side valley tucked into the western foothills of the Qazivand Mountain (Fig. 7).

The evidence from our excavations (Abdi *et al*., 2002a) seems to support our initial assessment of Wezmeh Cave as primarily a carnivore den in the Pleistocene, used intermittently in the Holocene by mobile people, perhaps pastoralists. On the basis of the nature and percentage of the archaeological material, especially the high proportion of Burnished Red-Slipped Ware, it seems safe to argue that the major period of occupation at the cave was the Early to Mid-Middle Chalcolithic period, followed by limited use from 5500 to 4500 B.P.

The area around Wezmeh Cave is rich in remains that can be attributed to mobile people, including nomadic pastoralists. Above Wezmeh Cave, on the mountain slope, we discovered an unnamed site (ID 88) with at least one stone alignment which may have been the remains of a lamb pen. On the floor of the plain, about 800 m west of the Cave, we discovered another unnamed site (ID 86), that was a very low hummock with no surface remains except for some rocks protruding from the ground, which may suggest that the site was a nomadic campsite. Perhaps most interesting of all, about 400 m northwest of Wezmeh Cave, on a gentle slope on the foothills, along a dry stream was yet another unnamed site (ID 85) with the remains of several circular stone features with no surface material, which in all likelihood are the remains of corrals.

The sites of ID 85, 86, and 88 cannot be dated to the Middle Chalcolithic because they lack surface material, but they nonetheless indicate the appeal of this area to pastoralists in earlier times when it enjoyed more precipitation and greener pastures. Although the general area has suffered from partial

drought in the past few years, even today, one can see shepherds from nearby villages, only a few hours' walk to the south and southwest, wandering in the area with their flocks.

Most importantly, about 1300 m northeast of Wezmeh Cave on the eastern foothills of Qazivand Mountain we discovered Qalaylan Rock-shelter (ID 77). Among the 128 pieces of chipped stone collected on the talus of this small shelter, the presence of microblades suggests that the site may have been occupied from the Epipaleolithic to the Early Chalcolithic period. A denticulate blade with sickle sheen and a trapezoidal microlith, however, most probably date to the Middle or Late Chalcolithic period (cf. similar examples from Bayat phase Deh Luran: Hole *et al.*, 1969, p. 77).

DISCUSSION

It seems that by the Late Neolithic/Early Chalcolithic period, the agricultural regime in the Islamabad Plain was at its optimal level. At this time, perhaps with an influx of people (responsible for the introduction of the J-Ware) from central and northern Mesopotamia into the West Central Zagros, the region experienced a rapid population growth, evidenced by a sharp increase in the number of settlements, some in more marginal, previously underexploited areas.

By the Early Middle Chalcolithic, the expansion of the agricultural regime, early experimentation with canal irrigation, and diversification of the staple crops (chickpeas and lentils perhaps being introduced to supplement wheat and barley) brought a large portion of the alluvial plain under cultivation. This forced the village-based herders to travel longer distances to access pastures, perhaps up to several kilometers from the alluvial plain, to places in the area around the Qazivand Mountain, where they stayed for a day or two, occupying natural features such as Wezmeh Cave and Qalaylan Rock-shelter.

By the Mid-Middle Chalcolithic, temporary campsites seem to have been located even farther away in the peripheries of the Plain in places like Tuwah Khoshkeh, which had been scarcely exploited in previous periods. By the Late Middle Chalcolithic, with a sharp drop in the number of sedentary settlements, perhaps as a result of a decline of the agricultural regime similar to that in the southern Zagros in Fars during Late Bakun – Early Lapui Phase (Sumner, 1988, 1994), it seems likely that more and more people turned to mobile pastoralism as a viable subsistence strategy. The shift to a nomadic way of life may have begun by the Late Middle Chalcolithic/Early Late Chalcolithic period, when we see isolated cemeteries at Hakalan and Parchineh in Pusht-i Kuh Luristan (Haerinck and Overlaet, 1996), with

evidence that connects Deh Luran and south-central Mesopotamia with the Central Zagros.

Let us now assess the data from the Islamabad Plain against those from the West Central Zagros Mountains from the Early to Late Chalcolithic period to evaluate this model.

Settlement Pattern

It is interesting that in so diverse and discontinuous a region as the Zagros Mountains and the lowlands to the west and southwest (Fig. 5), Chalcolithic settlement patterns were so dissimilar.

In the West Central Zagros, the most comprehensively surveyed plains—Mahidasht and Islamabad—reveal a generally similar settlement pattern, although the timing of the peak in the number of settlements differed somewhat. During the Early Chalcolithic, most habitable areas were sparsely settled, and small, undifferentiated village sites were located near rivers, streams, and springs. This was a continuation of the Neolithic settlement pattern (Smith and Young, 1983) and in a few areas, such as the northwestern Zagros (Swiny, 1975) and East Central Zagros such as Kangavar (Young, 1975) this pattern appears to have continued throughout the Chalcolithic period. In the great majority of arable mountain valleys and lowland plains, however, the settlement pattern shows significant changes during the Chalcolithic. The number of villages increased substantially at the end of the Early and especially in the Middle Chalcolithic. Then, in the Late Chalcolithic, the trend was abruptly reversed and the number of permanent settlements had dropped precipitously by the end of the period.

In the Mahidasht, one of the broadest and richest stretches of arable land in the Central Zagros, alluviation may have added as much as 10 m to the late prehistoric land surface and it is possible that many Chalcolithic sites are buried (Brookes, 1989). Nonetheless, the number of known villages shows a marked increase from the Neolithic to the Early Chalcolithic (Levine and McDonald, 1977). An abrupt and complete change in the ceramic assemblage, marked by the appearance of J-Ware at 70 sites, suggests that the increase may have been caused by an influx of people from the north and west like the one surmised for Islamabad Plain. In the Middle Chalcolihic, the number of sites rose sharply to a peak of 134. The average size of sites without heavy overburden was 1.6 ha in the Early Chalcolithic and just over 1 ha in the Middle Chalcolithic, but several sites covering more than 3 ha existed in both phases (Levine and McDonald, 1977). By the Late Chalcolithic, the florescence of village life in the Mahidasht seems to have ended, with only a handful of sites remaining. Apparently the settled population

declined considerably at this time because of either emigration, increased mortality, or adoption of a more mobile way of life like nomadism.

On the Kangavar Plain, about 100 km to the east of Mahidasht on the High Road, the pattern was noticeably different from that on the Mahidasht. The number of sites rose to 20 small villages in the Early Middle Chalcolithic, located exclusively near the streams crossing the central valley floor. Throughout Middle Chalcolithic and Early Late Chalcolithic, the number and location of sites remained relatively stable (17 in the Seh Gabi and 23 in Godin VII phases) (Young, 1975), although the ceramics and other aspects of material culture changed abruptly between these two phases (Levine and Young, 1987). The stability in the number of settlements probably indicates stability in subsistence strategy, and perhaps greater isolation from external influences. Only toward the end of the Late Chalcolithic was there a notable increase in the number of sites (39 by the Godin VI Phase). The delayed and less marked population increase in Kangavar plain, which is anomalous compared to other well-surveyed areas, may have been a result of a cooler, drier climate and thus lower agricultural production than on the plains further to the west. Sociopolitical developments and external connections with the lowlands may also have accounted for a local increase or influx of population during the Godin VI period (Henrickson, 1994). However, the Chalcolithic layers at Godin Tappeh are buried under deep Bronze and Iron Age deposits, and it is not known how large or important it was in relation to the rest of Kangavar during most of the period. During the Late Chalcolithic period, however, an oval enclosure was built at Godin, presumably by people of lowland origin (Badler, 2002; Weiss and Young, 1975; Young, 1986).

The smaller and more marginal Hulailan valley to the south of Mahidasht and southeast of Islamabad Plain has been more intensively surveyed (Mortensen, 1974, 1976, 1979). In the Hulailan valley, permanent settlements peaked in the Middle Chalcolithic period, but by the Late Chalcolithic, there seems to have been a diversification of subsistence activities with greater emphasis on mobile pastoralism (Mortensen, 1976), followed by a marked decline in sites of all types. Surveys in Hulailan found three cave-sites, one open-air site, and five village settlements dating to the Neolithic period, suggesting a diverse and not completely sedentary system in which both the valley floor and the surrounding hills were exploited. Neither J- nor Dalma wares occur so far southeast, and developments in the Early Chalcolithic and Early Middle Chalcolithic periods are thus unclear. Eleven small village sites with Black-on-Buff were recorded, all on the valley floor (Mortensen, 1976). In the Early Late Chalcolithic period, the number of sites remained stable, but the settlement system had again been diversified to include two open-air and two village sites in the hills, as well as seven villages on the valley floor (Mortensen, 1976), all yielding

ceramics related to generic Susa A, including Black-on-Red. The sharp decline occurred later, with only two villages on the valley floor, two cave-sites, and two open-air campsites, all yielding ceramics related to those of Sargarab and Godin VI (Mortensen, 1976), suggesting a less sedentary life and a concomitant increase in pastoralism in this area.

Mortuary Remains

In the Central Zagros, the pattern of burial within or near villages continued without much change from Middle Neolithic to Middle Chalcolithic. However, toward the end of the Middle Chalcolithic period, a major change seems to have occurred: the appearance of isolated cemeteries in Pusht-i Kuh in southwest Lurestan. Here, in the two cemeteries of Hakalan and Dum Gar-i Parchineh, 200 burials have been discovered (164 at Parchineh and 36 at Hakalan) which may represent people with a nomadic way of life (Haerinck and Overlaet, 1996; Vanden Berghe, 1973, 1975a,b, 1987). Parchineh, the larger and longer used cemetery, covers a vast area whose extent has not yet been determined, but Vanden Berghe estimates that as many as 1000 graves remain to be excavated (Hole, 1987a, p. 44).

The tombs from Parchineh and Hakalan consist of stone-lined and covered cists large enough to contain an adult lying extended. Nearly half the tombs lacked any grave goods; the remainder had generally one or more pots and rarely other artifacts such as seals, mace-heads, axes, rubbing stones, flint artifacts, or beads. No age or sex determinations were made.

Hakalan and Parchineh may represent an egalitarian society taking initial steps toward ranking. It is apparent that a few tombs signify higher status. For example, Parchineh B72 contains two alabaster jars, a large pedestaled ceramic bowl, a plain ceramic bowl, two small stone celts, two mace-heads, a spindle-whorl, and a bead-seal. Both the quantity of goods, the fact that some vessels were made of stone, and especially the co-occurrence of maces and a seal, which are often indicators of authority, make this tomb stand out. At Hakalan, much higher proportions of tombs contained artifacts, mostly painted ceramics, but there are also a number of richer tombs. For example, Hakalan A4 has nine ceramic vessels, one stone vessel, a blade, and three mace-heads.

There are reasons to argue that Hakalan and Parchineh fall within the territory of a nomadic group. This part of southern Pusht-i Kuh is ill-suited for permanent agricultural villages. In fact, no contemporary Chalcolithic settlement was found near the cemeteries and the area is today inhabited by nomadic pastoralists. Hakalan is at 1200 m and Parchineh at 900 m a.s.l.; that is, in the middle of the annual migratory routes. This does not mean that nomads remained in the vicinity of either cemetery for half a year at a time,

only that the cemeteries were close enough to summer and winter camping grounds, respectively, to make them accessible during all seasons.

The ceramics from Parchineh and Hakalan show stylistic similarities with both the Central Zagros and Deh Luran, especially Farukh phase ceramics from the latter area. This is not surprising since both cemeteries are less than 100 km from Deh Luran as the crow flies. (Compare, for instance, examples from Parchineh in Vanden Berghe, 1975a, figs. 5.2, 7, 9, 10, with those from Tappeh Farukhabad in Wright, 1981, figs. 23i–j, 20c, 21f, 20a, 22b.) Of particular significance among ceramics at Parchineh and Hakalan are examples of the Late Middle – Early Late Chalcolithic pottery from the West Central Zagros, especially Black-on-Red Ware, to which I will now turn.

Ceramic Evidence: Black-on-Red Ware and Nomadic Pastoralists

Perhaps the most important ceramic evidence pertaining to the development of mobile pastoralism in the West Central Zagros comes in the form of the Late Middle to Early Late Chalcolithic Black-on-Red (BOR) ware. The evidence from cemeteries at Dum Gar-i Parchineh and Hakalan (above) and the distribution of BOR in the West Central Zagros (Fig. 5) may be integrated into a model of socioeconomic developments in the region. Earlier I presented my argument for interpreting Hakalan and Parchineh as burial places of nomadic pastoralists groups. If this interpretation is reasonable, the chronological position of the ceramic assemblage from the longer-used Parchineh within the Zagros Chalcolithic becomes clearer. Unlike a single occupation level in a village site, a large graveyard like Parchineh, with several hundred graves, was probably used for several centuries. This may account for the Early to Late Chalcolithic parallels cited by the excavators (Haerinck and Overlaet, 1996; Vanden Berghe, 1987).

Statistical analyses of design elements (Henrickson, 1983, 1986, 1989) show that Parchineh is loosely grouped with the three Seh Gabi levels far to the northeast (Levine, 1974) and with ʻUbaid layers at Tell ʻUqair far to the south (Lloyd and Safar, 1943). If Parchineh served as a traditional graveyard on the annual migration route of a group of nomadic pastoralists, the group's regular pattern of medium to long distance travel could result in diverse ceramic associations. The Parchineh nomads would have wintered in a low altitude grazing ground somewhere south of Parchineh in the southern Pusht-i Kuh or in adjacent northern Deh Luran or eastern central Mesopotamia to escape the severe cold and snows of the higher Zagros. In the spring, they would have migrated northeastward, up into the Central Zagros to avoid the heat and winds of the lowland summer. Given the likely endpoints, the far-flung economic transactions of such migrating

pastoralists could have transmitted cultural information, perhaps accounting for the association between Parchineh and Seh Gabi painted ware. During their annual stay in the high altitude summer pastures in the Central Zagros, the Parchineh nomads would have exchanged animal products for grain and craft goods from villagers who made and used painted ware. They would not have carried great quantities of pottery with them back to their winter pastures in the fall, but some of the stylistic patterns perhaps carried on fabrics could have served as a source of aesthetic inspiration for the nomads' funerary pottery.

Parchineh's stylistic association with Tell 'Uqair and the central Mesopotamian ceramic tradition would not seem to fit into this model based on highland pastoralist migration pattern. 'Uqair is, however, the closest excavated lowland Late 'Ubaid site to Parchineh. In fact, in straight-line distance, 'Uqair is roughly as close as Seh Gabi, and must have been considerably closer in terms of travel time because of gentle topography.

The type of interaction between the central Mesopotamian 'Ubaid villagers and the nomadic highland pastoralists wintering nearby is unclear. A series of trading relationships between individual farmers and the herders may have been established as in similar modern situations (Barth, 1962). During their annual lowland sojourn in winter, nomadic pastoralists would have needed to replenish their stocks of agricultural products and village-made equipment in exchange for animal products as well as raw material from the mountains. Village as well as nomad craft items would have been included in barter transactions, resulting in the exchange of stylistic ideas and conventions, including those of pot painting. Pastoralists therefore bring the products of a neighboring niche to the central lowland 'Ubaid farmers. Thus, economic exchange between the Parchineh nomads and the central lowland villagers would have been "down-the-line trade," serving to redistribute diverse resources in a series of small-scale, local, dyadic transactions, and requiring neither central places of high population and centralized administration, nor central persons to organize the exchange (Renfrew, 1975).

The extremely widespread but ephemeral distribution of BOR ware is consistent with this hypothesis. BOR ware has been found, always in small quantities, at 'Uqair and Madhhur in the Hamrin region, at a number of sites in the west Central Zagros including Chogha Maran in Mahidasht and Chogha Gavaneh and Tuwah Khoshkeh in the Islamabad Plain, in the Saimareh Valleys and Pusht-i Kuh including the cemeteries of Parchineh and Hakalan, in northern Khuzestan (Susa, Jaffarabad, Sargarab) and as far east as the Bakhtiari mountains in the southern Zagros (Henrickson, 1985b). It can be argued that BOR ware can be identified as a distinctive craft product of a Central Zagros nomadic pastoralist group or associated farming villages along their migration routes. Its widespread distribution may be a

by-product of the long-distance migrations and related, widely scattered economic transactions. Although skin bags were likely used for transport of such staples as yogurt, butter, milk, ghee, and grains, a few small pottery vessels could have been used as containers, and, given their presence in tombs, as funerary gifts. Its rarity and distinctiveness would make BOR ware a valued item among the villagers in the West Central Zagros and surrounding areas. The striking occurrences of only a few examples of BOR ware at the widely scattered sites listed above is consistent with such a process.

Indeed, the broad but sparse distribution of BOR ware and the diverse stylistic associations of Parchineh Middle Chalcolithic monochrome painted buff ware may both be results of the rapid growth of nomadic pastoralism as a new specialized highland subsistence strategy in the West Central Zagros. The appearance of highland camps and cemeteries concides with a widespread decline in the number of permanent villages in the highland plains after the Mid-Middle Chalcolithic period. This highland shift from village farming to specialized nomadic pastoralism is evident in the survey data from Islamabad Plain as well as from the other West Central Zagros Plains (Mahidasht and Hulailan) discussed above.

To sum up, on the basis of the archaeological evidence from the highlands of the Central Zagros, there seem to be two distinct economic strategies taking shape in the Middle Chalcolithic. The East Central Zagros (the Kangavar Plain) seems to have maintained a village-based agricultural economy, perhaps as a result of environmental conditions, lower agricultural production, and social isolation. In the meantime, the West Central Zagros (the plains of Mahidasht, Islamabad, Hulailan) shows more interaction with the lowland plains such as Hamrin, Diyala, and Deh Luran to the west and southwest through the High Road. More importantly, the evidence from surveys and excavations suggests a gradual shift in the Chalcolithic period of the West Central Zagros from an undifferentiated village-based agricultural economy to a differentiated economy with increasing reliance on pastoralism. The survey evidence from successive phases of the Middle Chalcolithic suggests a gradual shift from village-based herding to mobile pastoralism with increasing distance from agricultural zone, while the excavated evidence suggests increasing interregional contact that may indicate higher mobility. Toward the end of the Middle Chalcolithic, the mortuary evidence suggests the initial steps toward the formation of a nomadic society, perhaps one that already traversed a wide region from the southwestern lowlands to the Central Zagros highlands.

While the environmental and economic conditions may have set the stage for a shift from sedentary mixed agriculture and herding to mobile pastoralism in the West Central Zagros, the formation of a nomadic identity may have had a socio-political impetus (cf. Irons, 1975). With emerging poli-

ties in the lowland plains of Mesopotamia and Susiana, with which mobile pastoralists had established extensive contact by now, and their encroachment into the highlands through the establishment of enclaves (Algaze, 1993; Rothman, 2001; Wright, 1998), mobile pastoralists may have felt a need to adopt new political strategies for protection.

For over a millennium from 6000–4900 B.P. (Early Late Chalcolithic to the Early Bronze Age I) we have little nomadic mortuary evidence from the Pusht-i Kuh (Vanden Berghe, 1984, p. 200). This is most probably a result of a major change in mortuary practice or a sampling error due to the unassuming appearance of the pottery of this era (Early to Late Uruk period). When we find evidence again—in the Early Bronze Age I—it is still in the form of individual tombs at Mir Khair and Kalleh Nesar Area A, not unlike earlier Hakalan and Parchineh burials. However, in Early Bronze Age II, individual graves are replaced by large communal tombs at the cemeteries of Bani Surmah and Kalleh Nesar, suggesting the emergence of a new nomadic social formation.

Meanwhile, emerging urban communities in central Mesopotamia in the Early Dynastic I period may have felt a threat from the West Central Zagros nomads, as evidenced by a chain of forts built on the High Road along the foothills of Zagros in the Hamrin area at sites such as Gubba and Songor (Fujii, 1981), Kheit Qasim (Forest-Foucault, 1980), Madhhur (Roaf, 1984), and Razuk (Gibson, 1981–90). Thus began several millennia of dynamic interaction, punctuated by episodes of hostility, between the town-dwellers and tent-dwellers, documented so dramatically in later Mesopotamian texts.

CONCLUSION: PASTORALISM AS AN ADAPTIVE STRATEGY

A prehistoric economy predominantly dependent on agricultural strategy entails risk. There was considerable uncertainty in crop yields due to frost, drought, excess precipitation, salinization of the fields due to inefficient water-management, pests, disease, intercommunity conflict, and other factors that could seriously jeopardize a community exclusively dependent on agriculture. Further, a prehistoric agricultural strategy based solely on one or two staple crops and some use of wild foods may not have been capable of producing sufficient foodstuff even under optimal combinations. A growing population may thus demand foodstuffs beyond the potentials of the production system. Under such circumstances, some groups, either sedentary or mobile, may begin to exploit adjacent production zones through temporary settlements. Over time, temporary settlements became permanent in order to reduce the energy expended in movement. Gradually, social contact between the new settlements and the original settlement decreases, and

an autonomous settlement based on a specialized strategy emerges. Each community develops its own characteristics while still participating in the regional cultural tradition.

The rational response to the risk involved in a single-strategy economy is diversification, enabling producers to reduce risk in the face of environmental and social factors. In the case of early village economies, diversification can take a number of forms, including diversification of staple crop production, and diversification of the production system by placing more emphasis on pastoralism.

Different production strategies pose different challenges in coordination of effort in space and time. In early agriculture, with the occasional exception of the communal maintenance of irrigation systems, most tasks could have been managed within the household. Even in some mixed economies (like village-based herding) factors related to timing and movement could still be administered within the household. Pastoralism, on the other hand, involves the coordination of complex movements of people and animals, necessitating communal institutions for scheduling and integration. With the increasing size of the herd and numbers of herders, the control mechanism that processes information concerning the distribution of resources, allocation of tasks, scheduling of movement, coordination of demands, and resolution of conflicts must, in turn, expand (Johnson, 1983).

With lands surrounding the villages coming increasingly under cultivation, village-based herders faced the problem of having to travel farther to take the flocks out of the agricultural zone. Initially, the distance traveled was more or less a day's walk, so that younger people, whose presence was not required for more essential agricultural activities, could have been entrusted with the task. But as the distance became greater and many small household herds were aggregated into a few large collective herds, mature individuals had to be sent out who were capable of managing and protecting the herd.

These herders were still members of the village community, but they had diminishing involvement with their home village, instead spending long portions of the year traveling from pasture to pasture at various elevations. Realizing the benefits of pastoralism, especially the demands of growing settlements for animal products, some herders may have started their own flock. These herders only occasionally returned to their home village, perhaps to exchange goods and to socialize. With more time in the wild and less time in their home village, some herders may have invited their households to accompany them on their trips. In a few years, social bonds that tied pastoralist and agriculturalist families began to fade away, as parents died, and brothers and sisters grew up and formed their own family. Within two to three generations, any memory the mobile pastoralists may have had of their

ancestral links with the village may have been lost. They considered themselves a different social group: nomads who, as far as they could remember, had always wandered the land.

ACKNOWLEDGMENTS

This paper presents a summary of my PhD dissertation research carried out with financial and logistical support from the University of Michigan Department and Museum of Anthropology, the National Science Foundation, the American Institute of Iranian Studies, and the Iranian Cultural Heritage Organization. I am grateful to many people involved in the field, laboratory, and library work, both in Iran and the United States, especially members of my dissertation committee, Henry Wright, Kent Flannery, Joyce Marcus, Jeff Parsons, and Margaret Cool Root for their unmitigated support. I am indebted to Reinhard Bernbeck (Binghamton University), Frank Hole (Yale University), Henry Wright (University of Michigan), Angela E. Close (University of Washington), and anonymous reviewers of *Journal of World Prehistory* for their constructive comments on earlier drafts of this paper. As always, any factual errors or interpretive fallacies are my responsibility alone. Last, but not least, this paper is dedicated to the memory of Elizabeth (Seana) Henrickson (1952–2002) whose extensive research and publications on the Chalcolithic period of the Zagros Mountains laid the foundation for the next generation of archaeologists working in this important region, including myself.

REFERENCES

Abdi, K. (1999a). Archaeological research in Iran's Islamabad Plain. *The Journal of the International Institute of the University of Michigan* **7**: 8–11.

Abdi, K. (1999b). Archaeological research in the Islamabad Plain, Central Western Zagros Mountains: Preliminary results of the first season, 1998. *Iran* **37**: 33–43.

Abdi, K. (2000). Islamabad, 1999. *Iran* **38**: 162–163.

Abdi, K. (2001a). Archaeological research in the Islamabad Plain: Report on the first and second seasons. *Iranian Journal of Archaeology and History* **26–27**: 47–61.

Abdi, K. (2001b). Islamabad, 2000. *Iran* **39**: 299–300.

Abdi, K. (2002). *Strategies of Herding: Pastoralism in the Middle Chalcolithic Period of the West Central Zagros Mountains*, PhD Dissertation, Department of Anthropology, The University of Michigan.

Abdi, K. (ed.) (in press). *Excavations at Operation W263 at Chogha Gavaneh. Report on the First and Second Seasons, 1998–1999*, Iranian Cultural Heritage Organization, Tehran, Iran.

Abdi, K., Biglari, F., and Heydari, S. (2002a). Islamabad Project, 2001: Test excavations at Wezmeh Cave. *Archäologische Mitteilungen aus Iran und Turan* **34**: 171–194.

Abdi, K., Nokandeh, G., Azadi, A., Biglari, F., Heydari, S., Farmani, D., Rezaii, A., and Mashkour, M. (2002b). Tuwah Khoshkeh: A Middle Chalcolithic pastoralist camp-site in the Islamabad Plain, West Central Zagros Mountains, Iran. *Iran* **40**: 43–74.

Adams, R. McC. (1974). The Mesopotamian social landscape: A view from the Frontier. In Moore, C. (ed.), *Reconstructing Complex Societies*, Supplement to the Bulletin of American Schools of Oriental Research 20, pp. 1–12.
Algaze, G. (1993). *The Uruk World System: The Dynamics of Expansion of Early Mesopotamian Civilization*, University of Chicago Press, Chicago.
Amanollahi-Baharvand, S. (1975). *The Baharvand, Former Pastoralists of Iran*, PhD Dissertation, Department of Anthropology, Rice University.
Amanollahi-Baharvand, S. (1989). *Pastoral Nomadism in Iran*, Agah Publishers, Tehran, Iran.
Amanollahi-Baharvand, S. (1992). *The Lurs: A Research on the Ethnic Continuity and Geographical Distribution of Lurs in Iran*, Agah Publishers, Tehran, Iran.
Badler, V. R. (2002). A chronology of Uruk artifacts from Godin Tepe in Central Western Iran and implications for the interrelations between the local and foreign cultures. In Postgate, J. N. (ed.), *Artefacts of Complexity: Tracking the Uruk in the Near East*, British School of Archaeology in Iraq, London, pp. 79–109.
Barfield, T. J. (1993). *The Nomadic Alternative*, Prentice Hall, Englewood Cliffs, NJ.
Barth, F. (1956). *Indus and Swat Kohistan: An Ethnographic Survey*, Forenede Trykerrier, Oslo, Norway.
Barth, F. (1961). *Nomads of South Persia: The Basseri Tribe of the Khamseh Confederacy*, Allen and Unwin, London.
Barth, F. (1962). Nomadism in the mountain and plateau areas of southwestern Asia. In *The Problems of the Arid Zone: Proceedings of the Paris Symposium of Arid Zone Research XVIII*, UNESCO, Paris, pp. 341–355.
Barth, F. (1964). Capital, investment and the social structure of a pastoral nomad group in south Persia. In Firth, R., and Yamey, B. S. (eds.), *Capital, Saving and Credit in Peasant Societies*, Aldine, Chicago, pp. 69–81.
Bar-Yosef, O., and Belfer-Cohen, A. (1989). The origins of sedentism and farming communities in the Levant. *Journal of World Prehistory* **3**: 447–498.
Bar-Yosef, O., and Khazanov, A. (eds.) (1992). *Pastoralism in the Levant: Archaeological Materials in Anthropological Perspectives*, Monographs in World Archaeology 10, Prehistory Press, Madison, WI.
Bates, D. G. (1972). Differential access to pasture in a Nomadic society: The Yörük of south eastern Turkey. In Irons, W., and Dyson-Hudson, N. (eds.), *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands, pp. 48–59.
Beck, L. (1980). Herd owners and their hired shepherds: The Qashqa'i of Iran. *Ethnology* **19**: 327–352.
Beck, L. (1990). *Nomad: A Year in the Life of a Qashqa'i Tribesman in Iran*, University of California Press, Berkeley.
Beck, L. (1998). Use of land by nomadic pastoralists in Iran, 1970–1988. *Yale School of Forestry and Environmental Studies Bulletin Series* **103**: 58–80.
Beck, L. (2003). Qashqa'i nomadic pastoralists and their use of land. In Miller, N. F., and Abdi, K. (eds.), *Yeki Bud, Yeki Nabud: Essays on the Archaeology of Iran in Honor of William M. Sumner*, Cotsen Institute of Archaeology of the UCLA Monograph 48, Los Angeles, pp. 289–304.
Bernbeck, R. (1993). *Steppe als Kulturlandschaft*, D. Reimer Verlag, Berlin.
Biglari, F. and Abdi, K. (1999). Paleolithic artifacts from Cham-e Souran, the Islamabad Plain, Central Western Zagros Mountains, Iran. *Archäologische Mitteilungen aus Iran und Turan* **31**: 1–8.
Black-Michaud, J. (1974). An ethnographic and ecological survey of Luristan, western Persia. *Middle Eastern Studies* **10**: 210–228.
Black-Michaud, J. (1986). *Sheep and land: The economies of power in a tribal society*, Cambridge University Press, Cambridge, UK.
Blumler, M. A., and Byrne, R. (1991). The ecological genetics of domestication and the origins of agriculture. *Current Anthropology* **32**: 23–54.
Bocherens, H., Mashkour, M., Billiou, D., Pellé, E., and Mariotti, A. (2001). A new approach for studying prehistoric herd management in arid areas: Intra-tooth isotopic analyses of

archaeological caprines from Iran. *Comptes Rendus de l'Académie des Sciences* **332**: 67–74.
Bradburd, D. A. (1996). Toward an understanding of the economics of pastoralism: The balance of exchange between pastoralists and nonpastoralists in Western Iran, 1815–1975. *Human Ecology* **24**: 1–38.
Braidwood, R. J. (1952). *The Near East and the Foundations for Civilization*, Condon Lectures, Oregon State System of Higher Education, Eugene.
Brookes, I. (1989). *The Physical Geography, Geomorphology and Late Quaternary History of the Mahidasht Project Area, Qara Su Basin, Central Western Iran*, ROM Mahidasht Project Report 1, Royal Ontario Museum, Toronto.
Castillo, J. S. (ed.) (1981). *Nomads and Sedentary Peoples*, El Colegio de Mexico, Mexico City.
Chang, C., and Koster, H. A. (1986). Beyond bones: Toward an archaeology of pastoralism. In Schiffer, M. J. (ed.), *Advances in Archaeological Method and Theory* 9, Academic Press, New York, pp. 97–148.
Clutton-Brock, J. (ed.) (1989). *The Walking Larder: Patterns of Domestication, Pastoralism, and Predation*, Unwin Hyman, London.
Clutton-Brock, J., and Grigson, C. (eds.) (1984). *Animals and Archaeology 3: Early Herders and Their Flocks*, BAR International Series, 202, Oxford.
Cowan, C. W., and Watson, P. J. (eds.) (1992). *The Origins of Agriculture: An International Perspective*, Smithsonian Institution Press, Washington, DC.
Craig, O. E., Mulville, J., Parker Pearson, M., Sokol, R., Gelsthorpe, K., Stacey, R., and Collins, M. J. (2000). Detecting milk proteins in ancient pots. *Nature* **408**: 312.
Cribb, R. L. D. (1984). Computer simulation of herding systems as an interpretative and heuristic device in the study of kill-off strategies. In Clutton-Brock, J., and Grigson, C. (eds.), *Animal and Archaeology 3: Early Herders and their Flocks*, BAR International Series, 202, Oxford, pp. 161–170.
Cribb, R. L. D. (1987). The logic of the herd: A computer simulation of archaeological herd structure. *Journal of Anthropological Archaeology* **6**: 376–415.
Cribb, R. L. D. (1991a). *Nomads and Archaeology*, Cambridge University Press, Cambridge, UK.
Cribb, R. L. D. (1991b). Mobile villagers: The structure and organisation of nomadic campsites in the Near East. In Gamble, C. S., and Boismier, W. (eds.), *Ethnoarchaeological Approaches to Mobile Campsites: Hunter Gatherer and Pastoralist Case Studies*, International Monographs in Prehistory, Ethnoarchaeological Series 1, Ann Arbor, MI, pp. 371–393.
Dahl, G., and Hjort, A. (1976). *Having Herds: Pastoral Herd Growth and Household Economy*, Stockholm Studies in Anthropology 2, University of Stockholm Department of Social Anthropology, Stockholm, Sweden.
Delougaz, P. P., and Kantor, H. J. (1996). *Chogha Mish, Vol. I: The First Five Seasons of Excavations, 1961–1971*. Alizadeh, A. (ed.). 2 Vols., Oriental Institute Publications 101, The Oriental Institute of the University of Chicago, Chicago.
Digard, J.-P. (1981). *Techniques des nomades Bakhtiari*, Cambridge University Press and Éditions de la Maison des Sciences de l'Homme, Cambridge, UK and Paris.
Digard, J.-P. (1987). Jeux de structure: segmentarité et pouvoir chez les nomades Baxtyari d'Iran. *L'Homme* **27**: 12–53.
Dollfus, G. (1983a). Tépé Djowi: contrôle stratigraphique. *Cahiers de la Délégation Archéologique Française en Iran* **13**: 17–131.
Dollfus, G. (1983b). Tépé Bendebal, travaux, 1977, 1978. *Cahiers de la Délégation Archéologique Française en Iran* **13**: 133–275.
Dudd, S., and Evershed, R. (1999). Evidence for varying patterns of exploitation of animal products in different prehistoric pottery traditions based on lipids in surface and absorbed residues. *Journal of Archaeological Science* **26**: 1473–1482.
Dyson-Hudson, N. (1972). The study of nomads. In Irons, W., and Dyson-Hudson, N. (eds.), *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands, pp. 2–29.

Dyson-Hudson, R. (1972). Pastoralism: Self image and behavioral reality. In Irons, W., and Dyson-Hudson, N. (eds.), *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands, pp. 30–47.
Dyson-Hudson, R., and Dyson-Hudson N. (1980). Nomadic pastoralism. *Annual Review of Anthropology* **9**: 15–61.
Edelberg, L. (1966–67). Seasonal dwellings of farmers in north-western Luristan. *Folk* **8–9**: 373–401.
Edzard, D. O. (1981). Mesopotamian nomads in the third millennium B.C. In Castillo, J. S. (ed.), *Nomads and Sedentary Peoples*, El Colegio de Mexico, Mexico City, pp. 37–45.
Ehlers, E. (1974). *Beiträge zur physischen Geographie Irans*, Im Selbstverlag des Geographischen Instituts der Universität Marburg, Marburg/Lahn, Germany.
Ekvall, R. B. (1968). *Fields on the Hoof: Nexus of Tibetan Nomadic Pastoralism*, Holt, Rinehart and Winston, New York.
Faegre, T. (1979). *Tents: Architecture of the Nomads*, John Murray, London.
Feilberg, C. G. (1944). *La tente noire*, Ethnografisk Rakke II, Nationalmusteets Skrifter, Copenhagen, Denmark.
Flannery, K. V. (1969). Origins and ecological effects of early domestication in Iran and the Near East. In Ucko, P. J., and Dimbleby, P. W. (eds.),*The Domestication and Exploitation of Plants and Animals*, Duckworth, London, pp. 73–100.
Forest-Foucault, Ch. (1980). Rapport sur les fouilles de Kheit Qasim 1, Hamrin. *Paléorient* **6**: 221–224.
Fujii, H. (ed.) (1981). Preliminary report of excavations at Gubba and Songor. *Al-Rafidan* **2**: 131–242.
Gamble, C. (1991). An introduction to the living spaces of mobile peoples. In Gamble, C. S., and Boismier, W. (eds.), *Ethnoarchaeological Approaches to Mobile Campsites: Hunter Gatherer and Pastoralist Case Studies*, International Monographs in Prehistory, Ethnoarchaeological Series 1, Ann Arbor, MI, pp. 1–23.
Gamble, C. S., and Boismier, W. (eds.) (1991). *Ethnoarchaeological Approaches to Mobile Campsites: Hunter–Gatherer and Pastoralist Case Studies*, International Monographs in Prehistory, Ethnoarchaeological Series 1, Ann Arbor, MI.
Garrard, A. N. (1984). The selection of south-west Asian animal domesticates. In Clutton-Brock, J., and Grigson, C. (eds.), *Animal and Archaeology 3: Early Herders and Their Flocks*. BAR International Series, 202, Oxford, pp. 117–132.
Gibson, M. (ed.) (1981–1990). *Uch Tepe*, 2 Vols, The Oriental Institute and the Carsten Niebuhr Institute, Chicago and Copenhagen.
Gilbert, A. S. (1975). Modern nomads and prehistoric pastoralists: The limits of analogy. *The Journal of the Ancient Near Eastern Society of Columbia University* **7**: 53–71.
Gilbert, A. S. (1983). On the origins of specialized nomadic pastoralism in western Iran. *World Archaeology* **15**: 105–119.
Grötzbach, E. (1982). *Das Hochgebirge als menschlicher Lebensraum*, Eichstätter Hochschulreden 33, Munich, Germany.
Grötzbach, E., and Stadl, C. (1997). Mountain peoples and cultures. In Messerli, B., and Ives, J. (eds.), *Mountains of the World: A Global Priority*, Parthenon Publishing Group, London, pp. 17–38.
Haerinck, E., and Overlaet, B. (1996). *The Chalcolithic Period Parchineh and Hakalan*, Luristan Excavation Documents I, Royal Museum of Art and History, Brussels, Germany.
Helmer, D. (1989). Le développement de la domestication au Proche-Orient de 9500 à 7500 B.P.: Les nouvelles données d'El Kown et de Ras Shamra. *Paléorient* **15**: 111–121.
Henrickson, E. F. (1983). *Ceramic Styles and Cultural Interaction in the Early and Middle Chalcolithic of the Central Zagros, Iran*, PhD Dissertation, Department of Anthropology, University of Toronto.
Henrickson, E. F. (1985a). The early development of pastoralism in the Central Zagros Highlands (Luristan). *Iranica Antiqua*, **20**: 1–42.
Henrickson, E. F. (1985b). An updated chronology of the Early and Middle Chalcolithic of the Central Zagros Highlands, western Iran. *Iran* **23**: 63–108.

Henrickson, E. F. (1986). Ceramic evidence for cultural interaction between Chalcolithic Mesopotamia and western Iran. In Kingery, W. D. (ed.), *Technology and Style. Ceramics and Civilization II*, American Ceramic Society, Columbus, pp. 87–133.
Henrickson, E. F. (1989). Ceramic evidence for cultural interaction between the 'Ubaid tradition and the Central Zagros Highlands, Western Iran. In Henrickson, E. F., and Thuesen, I. (eds.), *Upon This Foundation: The 'Ubaid Reconsidered*, The Carsten Niebuhr Institute, Copenhagen, Denmark, pp. 369–404.
Henrickson, E. F. (1994). The outer limits: Settlement and economic strategies in the Central Zagros Highlands during the Uruk Era. In Stein, G., and Rothman, M. (eds.), *Chiefdoms and Early States in the Near East:The Organizational Dynamics of Complexity*, Prehistory Press, Madison, WI, pp. 85–102.
Henrickson, E. F., and Vidali, V. (1987). The Dalma Tradition: Prehistoric interregional cultural integration in the highland of western Iran. *Paléorient* **13**: 37–46.
Hesse, B. (1982). Slaughter patterns and domestication: The beginning of pastoralism in western Iran. *Man* **17**: 403–417.
Hesse, B. (1984). These are our goats: The origins of herding in west central Iran. In Clutton-Brock, J., and Grigson, C. (eds.), *Animal and Archaeology 3: Early Herders and Their Flocks*, BAR International Series, 202, Oxford, pp. 243–264.
Heydari, S. (2001). Geology and geomorphology of the Islamabad survey area: Some preliminary observations. *Iranian Journal of Archaeology and History* **26–27**: 61–65.
Hole, F. (1977). *Studies in the Archaeological History of the Deh Luran Plain: Excavations at Chogha Sefid*, Memoir 9, University of Michigan Museum of Anthropology, Ann Arbor.
Hole, F. (1978). Pastoral nomadism in western Iran. In Gould, R. A. (ed.), *Explorations in Ethnoarchaeology*, University of New Mexico Press, Albuquerque, pp. 127–167.
Hole, F. (1979). Rediscovering the past in the present: Ethnoarchaeology in Luristan, Iran. In Kramer, C. (ed.), *Ethnoarchaeology: Implications of Ethnography for Archaeology*, Columbia University Press, New York, pp. 192–218.
Hole, F. (1980). The prehistory of herding: Some suggestions from ethnography. In Barrelet, M. T. (ed.), *L'Archéologie de l'Iraq du début de l'époque Néolitique à 333 avant notre ère*, Éditions de la Centre National de la Recherche Scientifique, Paris, pp. 119–130.
Hole, F. (1985). The organization of Susiana society. Periodization of site distributions. *Paléorient* **11**: 21–24.
Hole, F. (1987a). Archaeology of the Village Period. In Hole, F. (ed.), *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*, Smithsonian Institution Press, Washington, DC, pp. 29–78.
Hole, F. (1987b). Settlement and society in the Village Period. In Hole, F. (ed.), *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*, Smithsonian Institution Press, Washington, DC, pp. 79–106.
Hole, F. (ed.) (1987c). *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*, Smithsonian Institution Press, Washington, DC.
Hole, F. (1989). A two-part, two stage model of domestication. In Clutton-Brock, J. (ed.), *The Walking Larder: Patterns of Domestication, Pastoralism, and Predation*, Unwin Hyman, London, pp. 97–104.
Hole, F. (1996). The context of caprine domestication in the Zagros region. In Harris, D. R. (ed.), *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, Smithsonian Institution Press, Washington, DC, pp. 263–281.
Hole, F., Flannery, K. V., and Neely, J. A. (1969). *Prehistory and Human Ecology of the Deh Luran Plain*, Memoir 1, University of Michigan Museum of Anthropology, Ann Arbor.
Horrowitz, M. M. (1972). Ethnic boundary maintenance among pastoralists and farmers in the western Sudan (Niger). In Irons, W., and Dyson-Hudson, N. (eds.), *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands, pp. 105–114.
Horwitz, L. K., Tchernov, E., Ducos, P., Becker, C., Von Den Driesch, A., Martin, L., and Garrard, A. (1999). Animal domestication in the southern Levant. *Paléorient* **25**: 63–80.
Huntington, H. G. (1972). The rate of return from the Basseri's livestock investment. *Man* **7**: 476–479.

Husain, M. (1998). *Geography of Jammu and Kashmir: Some Aspects*, Rajesh Publications, New Delhi, India.
Ingold, T. (1980). *Hunters, Pastoralist and Ranchers*, Cambridge University Press, Cambridge, UK.
Irons, W. (1975). *The Yomut Turkmen: A Study of Social Organization Among a Central Asian Turkic Speaking Population*, Anthropological Papers 58, University of Michigan Museum of Anthropology, Ann Arbor.
Irons, W., and Dyson-Hudson, N. (eds.) (1972). *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands.
Jettmar, K. (1960). Soziale und wirtschaftliche Dynamik bei asiatischen Gebirgsbauren. *Sociologus* **10**: 120–138.
Johnson, D. L. (1969). *The Nature of Nomadism*, University of Chicago Department of Geography Research Paper 118, Chicago.
Johnson, G. A. (1983). Decision-making organization and pastoral nomad campsite. *Human Ecology* **11**: 175–99.
Khazanov, A. M. (1994). *Nomads and the Outside World*, University of Wisconsin Press, Madison.
Khoury, P. S., and Kostiner, J. (eds.) (1990). *Tribes and State Formation in the Middle East*, University of California Press, Berkeley.
Korobkova, G. (1999). The blade with "Mirror-like" polishing: The myth or the reality. In Kozlowski, S. (ed.), *The Eastern Wing of the Fertile Crescent: Late Prehistory of Greater Mesopotamian Lithic Industries*, BAR International Series 760, Archaeopress, Oxford, pp. 18–20.
Krader, L. (1959). The ecology of nomadic pastoralism. *International Social Science Journal* **11**: 499–510.
Lambton, A. K. S. (1953). *Landlord and Peasant in Persia*, Oxford University Press, Oxford.
Le Breton, L. (1957). The Early Periods at Susa, Mesopotamian Relations. *Iraq* **19**: 79–124.
Lees, S. H., and Bates, D. G. (1974). The origins of specialized nomadic pastoralism: A systemic model. *American Antiquity* **39**: 187–193.
Legge, T. (1996). The beginning of caprine domestication in southwest Asia. In Harris, D. R. (ed.), *The Origins and Spread of Agriculture and Pastoralism in Eurasia*, Smithsonian Institution Press, Washington, DC, pp. 238–262.
Levine, L. D. (1974). Archaeological investigations in the Mahidasht, western Iran. *Paléorient* **2**: 487–490.
Levine, L. D., and McDonald, M. A. (1977). The Neolithic and Chalcolithic periods in the Mahidasht. *Iran* **15**: 39–50.
Levine, L. D., and Young, Jr., T. C. (1987). A summary of the ceramic assemblages of the Central Western Zagros from the Middle Neolithic to the late third millennium B.C. In *Préhistoire de la Mésopotamie: La Mésopotamie préhistorique et l'exploration récente du Djebel Hamrin*, Éditions de la Centre National de la Recherche Scientifique, Paris, pp. 15–53.
Lloyd, S., and Safar, F. (1943). Tell 'Uqair: Excavations by the Iraq Government Directorate of Antiquities in 1940 and 1941. *Journal of Near Eastern Studies* **2**: 131–158.
Marsden, D. J. (1978). *The Qashqa'i Tribe and Tribal Identity*, Occasional Paper 6, Center for Development Studies, University of Swansea, Wales, UK.
Martin, F. R., and Sanz, A. G. (eds.) (1998). *Mesta, transhumancia y lana en la España moderna*, Grijalbo Mondodori, Barcelona, Spain.
Marx, E. (1977). The tribe as a unit of subsistence: Nomadic pastoralism in the Near East. *American Anthropologist* **79**: 343–363.
Mashkour, M., and Abdi, K. (2002). Archaeozoology and the question of pastoralist campsites: The case of Tuwah Khoshkeh. In Buitenhuis, H., Choyke, A. M., Mashkour, M., and Sl-Shiyab, A. H. (eds.), *Archaeozoology of the Near East* V, ARC Publication, Groningen, The Netherlands, pp. 211–227.
McCorriston, J., and Hole, F. (1991). The ecology of seasonal stress and the origin of ariculture in the Near East. *American Anthropologist* **93**: 46–69.

Miller, N. F. (1996). Seed eaters of the ancient Near East: Human or herbivore? *Current Anthropology* **37**: 521–528.
Mortensen, P. (1972). Seasonal camps and early villages in the Zagros. In Ucko, P., Tringham, R., and Dimbleby, G. W. (eds.), *Man, Settlement and Urbanism*, Duckworth, London, pp. 293–297.
Mortensen, P. (1974). A survey of prehistoric settlements in northern Luristan. *Acta Archaeologica* **45**: 1–47.
Mortensen, P. (1976). Chalcolithic settlements in the Holailan Valley. In Bagherzadeh, F. (ed.), *Proceedings of the 4th Symposium on Archaeological Research in Iran*, Iranian Center for Archaeological Research, Tehran, pp. 42–62.
Mortensen, P. (1979). The Holeilan Survey: A note on the relationship aims and methods. In *Akten des VII Internationalen Kongresses für Iranische Kunst und Archäologie, Munich, Sept. 7–10, 1976*, Archäologische Mitteilungen aus Iran, Ergänzungsband 6, Dietrich Reimer Verlag, Berlin.
Neely, J. A., and Wright, H. T. (1994). *Early Settlement and Irrigation on the Deh Luran Plain: Village and Early State Societies in Southwestern Iran*, Technical Report 26, University of Michigan Museum of Anthropology, Ann Arbor.
Nelson, C. (ed.) (1973). *The Desert and the Sown: Nomads in Wider Society*, Research Series No. 21, University of California Institute of International Studies, Berkeley.
Nyerges, E. (1980). Traditional pastoralism in environmental perspective. *Expedition* **22**: 36–41.
Oates, J. (1983). Ubaid Mesopotamia reconsidered. In Young, T. C., and Smith, P. E. L. (eds.), *The Hilly Flanks: Essays on the Prehistory of Southwestern Asia Presented to Robert J. Braidwood*, Studies in Ancient Oriental Civilizations 36, The Oriental Institute of the University of Chicago, Chicago, pp. 251–281.
Oberling, P. (1974). *The Qashqa'i Nomads of Fars*, Mouton, The Hague, The Netherlands.
Peters, J., Helmer, D., Von Den Driesch, A., and Saña Segui, M. (1999). Early animal husbandry in the northern Levant. *Paléorient* **25**: 27–48
Ponz, H. (1988). The importance, status and structure of Almwirtschaft in the Alps. In Allan, N. J. R., Knapp, G. W., and Stadel, C. (eds.), *Human Impact on Mountains*. Rowman and Littlefield, Totowa, NJ, pp. 109–115.
Price, L. W. (1981). *Mountains and Man: A Study of Process and Environment*, University of California Press, Berkeley.
Redding, R. W. (1981). *Decision Making in Subsistence Herding of Sheep and Goats in the Middle East*, PhD Dissertation, Department of Anthropology, University of Michigan.
Redding, R. W. (1984). Theoretical determinants of a herder's decisions: Modeling variation in the sheep/goat ratio. In Clutton-Brock, J., and Grigson, C. (eds.), *Animal and Archaeology 3: Early Herders and Their Flocks*, BAR International Series, 202, Oxford, pp. 161–170.
Reed, C. A. (1961). Osteological evidences for prehistoric domestication in southwestern Asia. *Zeitschrift für Tierzüchtung und Züchtungsbiologie* **75**: 31–38.
Renfrew, C. (1975). Trade as action at a distance: Questions of integration and communication. In Sabloff, J., and Lamberg-Karlovsky, C. C. (eds.), *Ancient Civilization and Trade*, University of New Mexico Press, Albuquerque, pp. 3–59.
Rinschede, G. (1979). *Die Transhumance in den französischen Alpen und in den Pyrenäen*, Westfälische Geographische Studien 32, Münster, Ireland.
Rinschede, G. (1984). Wanderviehwirtschaft im Vergleich: Alpen/Pyrenaen-Hochgebirge der westlichen USA. In Grötzbach, E., and Rinschede, G. (eds.), *Beitrage zur vergleichenden Kutlturgeographie der Hochgebirge*, Eichastaetter Beitrage 12, Verlag Pustet, Regensburg, Germany, pp. 285–304.
Rinschede, G. (1988). Transhumance in European and American mountains. In Allan, N. J. R., Knapp, G. W., and Stadel, C. (eds.), *Human Impact on Mountains*, Rowman and Littlefield, Totowa, NJ, pp. 96–108.
Roaf, M. (ed.) (1984). Tell Madhhur: A summary report on the excavations. *Sumer* **43**: 108–167.

Rothman, M. S. (ed.) (2001). *Uruk Mesopotamia and Its Neighbors: Cross-Cultural Interactions in the Era of State Formation*, School of American Research Advanced Seminar Series, Santa Fe, NM.
Rowton, M. B. (1973a). Autonomy and nomadism in Western Asia. *Orientalia* **42**: 247–258.
Rowton, M. B. (1973b). Urban autonomy in a nomadic environment. *Journal of Near Eastern Studies* **32**: 201–215.
Rowton, M. B. (1974). Enclosed nomadism. *Journal of the Economic and Social History of the Orient* **17**: 1–30.
Rowton, M. B. (1977). Dimorphic structure and typology. *Oriens Antiquus* **15**: 17–31.
Safar, F., Mostafa, M. A., and Lloyd. S. (1981). *Eridu*, State Organization of Antiquities and Heritage, Baghdad, Iraq.
Salzman, P. C. (1971). Movement and resource extraction among pastoral nomads: The case of the Shah Nawazi Baluch. *Anthropological Quarterly* **44**: 185–197.
Salzman, P. C., and Sadala, E. (eds.) (1980). *When Nomads Settle: Processes of Sedentarization as Adaptation and Response*, Praeger, New York.
Scholz, F. (1995). *Nomadismus: Theorie und Wandel einer sozio-ökologischen Kulturweise*, Erdkundliches Wissen 118, Franz Steiner Verlag, Stuttgat, Germany.
Smith, A. B. (1992). *Pastoralism in Africa: Origins and Development Ecology*, Ohio University Press, Athens.
Smith, P. E. L., and Young, T. C., Jr. (1983). The force of numbers: Population pressure in the Central Western Zagros, 12,000–4500 B.C. In Young, T. C., and Smith, P. E. L. (eds.), *The Hilly Flanks: Essays on the Prehistory of Southwestern Asia Presented to Robert J. Braidwood*, Studies in Ancient Oriental Civilizations 36, The Oriental Institute of the University of Chicago, Chicago, pp. 141–161.
Spooner, B. (1971). Towards a generative model of nomadism. *Anthropological Quarterly* **44**: 198–210.
Spooner, B. (1972). The status of nomadism as a cultural phenomenon in the Middle East. In Irons, W., and Dyson-Hudson, N. (eds.), *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands, pp. 122–132.
Spooner, B. (1973). *The Cultural Ecology of Pastoral Nomads*, Addison-Wesley Module in Anthropology 45.
Stauffer, T. R. (1965). The economics of nomadism in Iran. *The Middle East Journal* **19**: 284–302.
Straus, L. G. (1997). Convenient cavities: Some human uses of caves and rockshelters. In Bonsall, C., and Tolan-Smith, C. (eds.), *The Human Use of Caves*, BAR International Series 667, Oxford, pp. 1–8.
Sumner, W. M. (1988). Prelude to Proto-Elamite Anshan: The Lapui Phase. *Iranica Antiqua* **23**: 23–43.
Sumner, W. M. (1994). The evolution of tribal society in the Southern Zagros Mountains, Iran. In Stein, G., and Rothman, M. (eds.), *Chiefdoms and Early States in the Near East: The Organizational Dynamics of Complexity*, Prehistory Press, Madison, WI, pp. 47–65
Swidler, W. W. (1972). Some demographic factors regulating the formation of flocks and camps among the Brahui of Baluchistan. In Irons, W., and Dyson-Hudson, N. (eds.), *Perspectives on Nomadism*, E. J. Brill, Leiden, The Netherlands, pp. 69–75.
Swidler, W. W. (1973). Adaptive processes regulating nomadic–sedentary interaction in the Middle East. In Nelson, C. (ed.), *The Desert and the Sown: Nomads in Wider Society*, Research Series 21, University of California Institute of International Studies, Berkeley, pp. 23–41.
Swiny, S. (1975). Survey in northwest Iran, 1971. *East and West* **25**: 77–96.
Szarzynska, K. (2002). *Sheep Husbandry and Production of Wool, Garments and Cloths in Archaic Sumer*, Agade, Warsaw, Poland.
Tapper, R. L. (1979). *Pasture and Politics: Economics, Conflict and Ritual among Shahsevan Nomads of N.W. Iran*, Academic Press, London.
Tapper, R. L. (1998). *Frontier Nomads of Iran: A Political and Social History of the Shahsevan*, Cambridge University Press, Cambridge, UK.

Uerpmann, H. P. (1987). *The Ancient Distribution of Ungulate Mammals in the Middle East*, Beihefte zum Tübinger Atlas des Vorderen Orients, Reihe A27, Dr. Ludwig Reichert Verlag, Wiesbaden, Germany.
Vainshtein, S. I. (1980). *Nomads of South Siberia: The Pastoral Economics of Tuva*, Cambridge University Press, Cambridge, UK.
Vanden Berghe, L. (1973). La nécropole de Hakalan. *Archeologia* **57**: 49–58.
Vanden Berghe, L. (1975a). La nécropole de Dum Gar Parchineh. *Archeologia* **79**: 46–61.
Vanden Berghe, L. (1975b). Fouilles au Lorestan: La nécropole de Dum Gar Parchineh. In Bagherzadeh, F. (ed.), *Proceedings of the 3rd Annual Symposium on Archaeological Research in Iran*, Iranian Center for Archaeological Research, Tehran, pp. 45–62.
Vanden Berghe, L. (1984). Prospections et Fouilles au Pusht-i Kuh, Luristan. *Archiv für Orientforschung* **31**: 200–209.
Vanden Berghe, L. (1987). Luristan, Pusht-i Kuh au Chalcolithique Moyen (Les necropolis de Parchinah et de Hakalan). In *Préhistoire de la Mésopotamie: La Mésopotamie préhistorique et l'exploration récente du Djebel Hamrin*, Éditions de la Centre National de la Recherche Scientifique, Paris, pp. 91–126.
van Zeist, W. (1967). Late quaternary vegetation history of western Iran. *Review of Paleobotany and Palynology* **2**: 301–311.
van Zeist, W., and Bottema. S. (1977). Palynological investigations in western Iran. *Paleohistoria* **19**: 19–95.
van Zeist, W., and Bottema. S. (1982). Vegetational history of the eastern Mediterranean and the Near East during the last 20,000 years. In Bintliff J. L., and van Zeist, W. (eds.), *Palaeoclimates, Palaeoenvironments and Human Communities in the Eastern Mediterranean Region in Later Prehistory*, BAR International 133, Oxford, pp. 277–321.
van Zeist, W., and Bottema. S. (1991). *Late Quaternary Vegetation of the Near East*, Tübinger Atlas des Vorderen Orients Reihe A, Nr. 18, Dr. Ludwig Reichert Verlag, Wiesbaden, Germany.
Vardiman, E. E. (1977). *Nomaden: Schöpfer einer neuen Kultur im Vorderen Orient*, Economische Verlag, Düsseldorf.
Vidal de la Blache, P. (1922). *Principes de géographie humaine*, A. Colin, Paris.
Vincze, L. (1980). Peasant animal husbandry: A dialectical model of techno-environmental integration in agro-pastoral societies. *Ethnology* **19**: 387–403.
Weiss, H., and Young, T. C., Jr. (1975). The merchants of Susa: Godin V and plateau–lowland relations in the fourth millennium B.C. *Iran* **13**: 1–17.
Wright, H. T. (1981). *An Early Town in the Deh Luran Plain: Excavations at Tepe Farukhabad*, Memoir 13, University of Michigan Museum of Anthropology, Ann Arbor.
Wright, H. T. (1987). The Susiana Hinterland during the era of primary state formation. In Hole, F. (ed.), *The Archaeology of Western Iran: Settlement and Society from Prehistory to the Islamic Conquest*, Smithsonian Institution Press, Washington, DC, pp. 141–155.
Wright, H. T. (1998). Uruk States in Southwestern Iran. In Feinman, G., and Marcus, J. (eds.), *Archaic States*, School of American Research Advanced Seminar Series, Santa Fe, NM, pp. 173–192.
Wright, H. T. (in press). Chipped stone. In Abdi, K. (ed.), *Excavations at Operation W263 at Chogha Gavaneh. Report on the First and Second Seasons, 1998–1999*, Iranian Cultural Heritage Organization, Tehran, Iran.
Young, T. C., Jr. (1975). Kangavar Valley Survey. *Iran* **13**: 191–193.
Young, T. C., Jr. (1986). Godin Tepe Period VI/V and central western Iran at the end of the fourth millennium. In Finkbeiner, U., and Röllig, W. (eds.), *Gamdat Nasr: Period or Regional Style?*, Dr. Ludwig Reichert Verlag, Wiesbaden, Germany, pp. 212–228.
Zagarell, A. (1975). Archaeological survey in the North West Bakhtiari Mountains. In Bagherzadeh, F. (ed.), *Proceedings of the 2nd Annual Symposium on Archaeological Research in Iran*, Iranian Center for Archaeological Research, Tehran, pp. 145–148.
Zagarell, A. (1982). *The Prehistory of the Northeast Bahtiyari Mountains, Iran. The Rise of a Highland Way of Life*, Beihefte zum Tübinger Atlas des Vorderen Orients 42, Dr. Ludwig Reichert Verlag, Wiesbaden, Germany.

Zagarell, A. (1989). Pastoralism and the early state in Greater Mesopotamia. In Lamberg-Karlovsky, C. C. (ed.), *Archaeological Thought in America*, Cambridge University Press, Cambridge, UK, pp. 280–301.
Zeder, M. A. (1994). After the revolution: Post-neolithic subsistence in northern Mesopotamia. *American Anthropologist* **96**: 97–126.
Zeder, M. A. (1999) Animal domestication in the Zagros. A review of past and current research. *Paléorient* **25**: 11–26.
Zeder, M. A. (2001). A metrical analysis of a collection of modern goats (*Capra hircus aegagrus* and *C. h. hircus*) from Iran and Iraq: Implications for the study of caprine domestication. *Journal of Archaeological Science* **28**: 61–79.
Zeder, M. A., and Hesse, B. (2000). The initial domestication of goats (*Capra hircus*) in the Zagros Mountains 10,000 years ago. *Science* **287**: 2254–2257.
Ziegler, C. (1953). *Die Keramik von der Qala des Haggi Mohämmed*, Gebr, Mann, Berlin.
Zohary, M. (1973). *Geobotanical Foundations of the Middle East*, G. Fischer, Stuttgart, Germany.